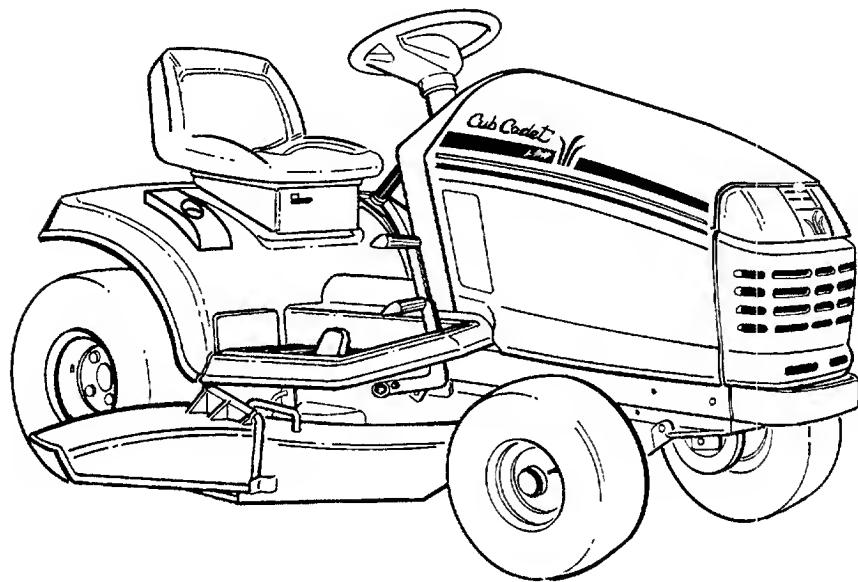




OWNER'S GUIDE



Series 2000
TRACTOR
Model Numbers
2160
2165



IMPORTANT: READ SAFETY RULES AND INSTRUCTIONS CAREFULLY

Warning: This unit is equipped with an internal combustion engine and should not be used on or near any unimproved forest-covered, brush-covered or grass-covered land unless the engine's exhaust system is equipped with a spark arrester meeting applicable local or state laws (if any). If a spark arrester is used, it should be maintained in effective working order by the operator. In the State of California the above is required by law (Section 4442 of the California Public Resources Code). Other states may have similar laws. Federal laws apply on federal lands. A spark arrester for the muffler is available through your nearest engine authorized service dealer or contact the service department, P.O. Box 368022 Cleveland, Ohio 44136-9722.

MTD PRODUCTS INC. P.O. BOX 368022 CLEVELAND, OHIO 44136-9722

LIMITED WARRANTY

**TWO-YEAR RESIDENTIAL
ONE-YEAR COMMERCIAL**

Proper maintenance of your Cub Cadet equipment is the owner's responsibility. Follow the instructions in your owner's manual for correct lubricants and maintenance schedule. Your Cub Cadet dealer carries a complete line of quality lubricants and filters for your equipment's engine, transmission, chassis and attachments.

RIDING MOWERS, LAWN TRACTORS, GARDEN TRACTORS, CUB CADET ATTACHMENTS AND HOME MAINTENANCE PRODUCTS

This limited warranty for residential users, covers any defect in materials or workmanship in your Cub Cadet equipment for two years from the date of purchase for the first user purchaser. We will replace or repair any part or parts without charge through your authorized Cub Cadet dealer.

Batteries have a one-year prorated limited warranty with 100% replacement during the first three months.

V-belts for either the traction drive or any attachments are covered for one year only.

Cub Cadet equipment used commercially is warranted for one year only.

(Commercial use is defined as either having hired operators or used for income producing purposes.)

ITEMS NOT COVERED

The warranty does not cover routine maintenance items such as lubricants, filters (oil, fuel, air and hydraulic), cleaning, tune-ups, brake and/or clutch inspection, adjustments made as part of normal maintenance, blade sharpening, set-up, abuse, accidents and normal wear. It does not cover incidental costs such as transporting your equipment to and from the dealer, telephone charges or renting a product temporarily to replace a warranted product.

There is no other express warranty.

HOW TO OBTAIN SERVICE

Contact your authorized Cub Cadet servicing dealer who sold you your Cub Cadet equipment. If this dealer is not available, see the Consumer Yellow Pages under "lawn mowers" for the name of a dealer near you.

If you need further assistance in finding an authorized Cub Cadet servicing dealer, contact:

**Cub Cadet Corporation
Post Office Box 368023
Cleveland, Ohio 44136**

HOW DOES STATE LAW APPLY?

This limited warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

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WARNING

The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.



WARNING

This unit is equipped with an internal combustion engine and should not be used on or near any unimproved forest-covered, brush-covered, or grass-covered land unless the engine's exhaust system is equipped with a spark arrester meeting applicable local or state laws (if any). If a spark arrester is used, it should be maintained in effective working order by the operator.

In the State of California, the above is required by law (Section 4442 of the California Public Resources Code). Other States may have similar laws. Federal laws apply to federal lands. A spark arrester muffler is available at your nearest engine authorized service center.

IMPORTANT

SAFE OPERATION PRACTICES



THIS SYMBOL POINTS OUT IMPORTANT SAFETY INSTRUCTIONS WHICH, IF NOT FOLLOWED, COULD ENDANGER THE PERSONAL SAFETY AND/OR PROPERTY OF YOURSELF AND OTHERS. READ AND FOLLOW ALL INSTRUCTIONS IN THIS MANUAL BEFORE ATTEMPTING TO OPERATE YOUR UNIT. FAILURE TO COMPLY WITH THESE INSTRUCTIONS MAY RESULT IN PERSONAL INJURY. WHEN YOU SEE THIS SYMBOL—



HEED ITS WARNING.



DANGER

Your lawn mower was built to be operated according to the rules for safe operation in this manual. As with any type of power equipment, carelessness or error on the part of the operator can result in injury. This lawn mower is capable of amputating hands and feet or throwing objects. Failure to observe the following safety instructions could result in serious injury or death.



I. GENERAL OPERATION

1. Read, understand and follow all instructions in the manual and on the machine before starting. Keep this manual in a safe place for future and regular reference and for ordering replacement parts
2. Only allow responsible individuals familiar with the instructions to operate the machine. Know the controls and how to stop the machine quickly.
3. Do not put hands or feet under the cutting deck or near rotating parts.

4. Clear the area of objects such as rocks, toys, wire, etc. which could be picked up and thrown by the blades. A small object may have been overlooked and could be accidentally thrown by the mower in any direction and cause injury to you or a bystander. To help avoid a thrown objects injury, keep children, animals, bystanders and helpers at least 75 feet from the mower while it is in operation. Always wear safety glasses with side shields or safety goggles during operation or while performing an adjustment or repair, to protect eyes from foreign objects. Stop the blades when crossing gravel drives, walks or roads.
5. Be sure the area is clear of other people before mowing. Stop machine if anyone enters the area.
6. Never carry passengers.
7. Disengage the blades before shifting into reverse and backing up. Always look down and behind before and while backing.
8. Be aware of the mower and attachment discharge direction and do not point it at anyone. Do not operate the mower without either the entire grass catcher or the chute guard in place.
9. Slow down before turning. Operate the machine smoothly. Avoid erratic operation and excessive speed.
10. Never leave a running machine unattended. Always turn off the blades, place the transmission in neutral, set the parking brake, stop the engine and remove key before dismounting.
11. Turn off blades when not mowing.
12. Stop the engine and wait until the blades come to a complete stop before (a) removing the grass catcher or unclogging chute, or (b) making any repairs, adjusting or removing any grass or debris.
13. Mow only in daylight or good artificial light.
14. Do not operate the machine while under the influence of alcohol or drugs.
15. Watch for traffic when operating near or crossing roadways.
16. Use extra care when loading or unloading the machine into a trailer or truck. This unit should not be driven up or down a ramp onto a trailer or truck under power, because the unit could tip over causing serious personal injury. The unit must be pushed manually on a ramp to load or unload properly.
17. Never make a cutting height adjustment while the engine is running if the operator must dismount to do so.
18. Wear sturdy, rough-soled work shoes and close-fitting slacks and shirts. Do not wear loose fitting clothes or jewelry. They can be caught in moving parts. Never operate a unit in bare feet, sandals or sneakers.
19. Check overhead clearance carefully before driving under power lines, wires, bridges or low hanging tree branches, before entering or leaving buildings, or in any other situation where the operator may be struck or pulled from the unit, which could result in serious injury.
20. Disengage all attachment clutches, thoroughly depress the brake pedal and shift into neutral before attempting to start the engine.
21. Your mower is designed to cut normal residential grass of a height no more than 10". Do not attempt to mow through unusually tall, dry grass (e.g. pasture) or piles of dry leaves. Debris may build up on the mower deck or contact the engine exhaust presenting a potential fire hazard.
22. Use only accessories approved for this machine by *Cub Cadet*. Read, understand and follow all instructions provided with the approved accessory.



II. SLOPE OPERATION

Slopes are a major factor related to loss of control and tip-over accidents, which can result in severe injury or death. **All** slopes require extra caution. If you cannot back up the slope or if you feel uneasy on it, do not mow it.

For your safety, use the slope gauge included as part of this manual to measure slopes before operating this unit on a sloped or hilly area. If the slope is greater than 15° as shown on the slope gauge, do not operate this unit on that area or serious injury could result.

DO:

Mow up and down slopes, not across.

Remove obstacles such as rocks, limbs, etc.

Watch for holes, ruts or bumps. Uneven terrain could overturn the machine. **Tall grass can hide obstacles.**

Use slow speed. Choose a low enough gear so that you will not have to stop or shift while on the slope. Always keep the machine in gear when going down slopes to take advantage of engine braking action.

Follow the manufacturer's recommendations for wheel weights or counterweights to improve stability.

Use extra care with grass catchers or other attachments. These can change the stability of the machine.

Keep all movement on the slopes **slow and gradual**. Do not make sudden changes in speed or direction. Rapid engagement or braking could cause the front of the machine to lift and rapidly flip over backwards, which could cause serious injury.

Avoid starting or stopping on a slope. If the tires lose traction, disengage the blades and proceed slowly **straight** down the slope.

DO NOT:

Do not turn on slopes unless necessary; then, turn slowly and gradually downhill, if possible.

Do not mow near drop-offs, ditches or embankments. The mower could suddenly turn over if a wheel is over the edge of a cliff or ditch, or if an edge caves in.

Do not mow on wet grass. Reduced traction could cause sliding.

Do not try to stabilize the machine by putting your foot on the ground.

Do not use the grass catcher on steep slopes.



III. CHILDREN

Tragic accidents can occur if the operator is not alert to the presence of children. Children are often attracted to the machine and the mowing activity. **Never** assume that children will remain where you last saw them.

1. Keep children out of the mowing area and in watchful care of an adult other than the operator.
2. Be alert and turn the machine off if children enter the area.
3. Before and when backing up, look behind and **down** for small children.
4. Never carry children, even with the blades off. They may fall off and be seriously injured or may interfere with safe machine operation.
5. Never allow children under 14 years old to operate the machine. Children 14 years and over should only operate the machine under close parental supervision and proper instruction.
6. Use extra care when approaching blind corners, shrubs, trees or other objects that may obscure your vision of a child or other hazard.
7. Remove the key when the machine is left unattended to prevent unauthorized operation.

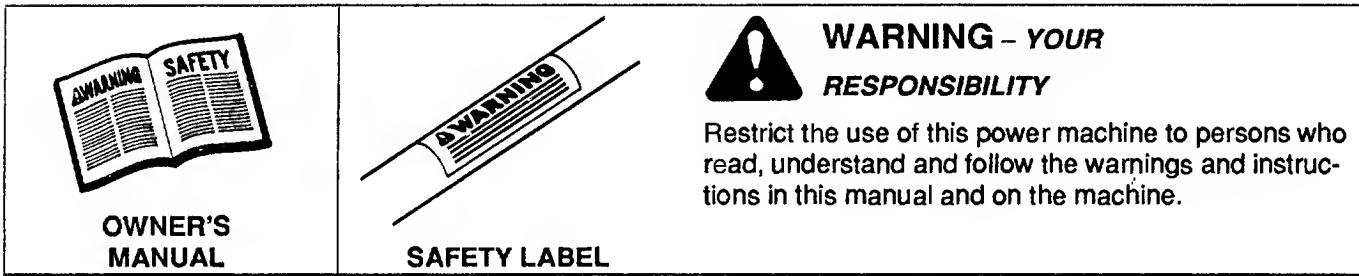


IV. SERVICE

1. Use extreme care in handling gasoline and other fuels. They are extremely flammable and the vapors are explosive.
 - a. Use only an approved container.
 - b. Never remove fuel cap or add fuel with the engine running. Allow the engine to cool at least two minutes before refueling.
 - c. Replace the fuel cap securely and wipe off any spilled fuel before starting the engine as it may cause a fire or explosion.
 - d. Extinguish all cigarettes, cigars, pipes and other sources of ignition.
 - e. Never refuel the machine indoors because fuel vapors will accumulate in the area.
 - f. Never store the fuel container or machine inside where there is an open flame or spark, such as a gas hot water heater, space heater or furnace.
2. Never run a machine inside a closed area.
3. To reduce fire hazard, keep the machine free of grass, leaves or other debris build-up. Clean up oil or fuel spillage. Allow the machine to cool at least 5 minutes before storing.
4. Before cleaning, repairing or inspecting, make certain the blade and all moving parts have stopped. Disconnect the spark plug wire, and keep the wire away from the spark plug to prevent accidental starting.
5. Check the blade and engine mounting bolts at frequent intervals for proper tightness. Also visually inspect blades for damage (e.g., excessive wear, bent, cracked). Replace with blades which meet original equipment specifications.
6. Keep all nuts, bolts and screws tight to be sure the equipment is in safe working condition.
7. Never tamper with safety devices. Check their proper operation regularly. Use all guards as instructed in this manual.
8. After striking a foreign object, stop the engine, remove the wire from the spark plug and thoroughly inspect the mower for any damage. Repair the damage before restarting and operating the mower.
9. Grass catcher components are subject to wear, damage and deterioration, which could expose moving parts or allow objects to be thrown. For your safety protection, frequently check the components and replace with manufacturer's recommended parts when necessary.

10. Mower blades are sharp and can cut. Wrap the blades or wear gloves, and use extra caution when servicing blades.
11. Check brake operation frequently. Adjust and service as required.
12. Muffler, engine and belt guards become hot during operation and can cause a burn. Allow to cool down before touching.
13. Do not change the engine governor settings or overspeed the engine. Excessive engine speeds are dangerous.
14. Observe proper disposal laws and regulations. Improper disposal of fluids and materials can harm the environment and the ecology.

- a. Prior to disposal, contact your local Environmental Protection Agency to determine the proper method for disposing of the waste. Recycling centers are established to properly dispose of materials in an environmentally safe fashion.
- b. Use proper containers when draining fluids. Do not use food or beverage containers that may mislead someone into drinking from them. Properly dispose of the containers immediately following the draining of fluids.
- c. DO NOT pour oil or other fluids into the ground, down a drain or into a stream, pond, lake, or other body of water. Observe Environmental Protection Agency regulations when disposing of oil, fuel, coolant, brake fluid, filters, batteries, tires and other harmful waste.



PRODUCT GRAPHICS

Keep safety product graphics (decals) clean. Replace any safety graphic that is damaged, destroyed, miss-

ing, painted over or can no longer be read. Replacement safety graphics are available through your dealer.



GENERAL SAFETY INSTRUCTIONS
WARNING – LOCATED ON RIGHT
SIDE OF RUNNING BOARD
(MODEL 2165 SHOWN)

TO THE OWNER

Contained in this manual are operation, lubrication and maintenance instructions for the *Cub Cadet* tractors, Models 2160 and 2165. The material has been prepared in detail to help you better understand the correct care and efficient operation of your tractor. Before you operate the tractor, study this manual carefully. Additional copies may be ordered from your dealer at a nominal price.

Your local authorized dealer is interested in the performance you receive from your tractor. He has factory-trained servicemen who are informed in the latest method of servicing tractors, modern tools, and original-equipment service parts which assure proper fit and good performance.



CAUTION

DO NOT tow your Model 2165 tractor. Towing may damage the transmission. Place the tractor on a LEVEL SURFACE before pulling the transmission release lever to the disengaged position.

The *Cub Cadet* gear drive (Model 2160) system or hydrostatic drive (Model 2165) system will require minimal service if recommended operation and maintenance procedures are followed.

To obtain top performance and assure economical operation, the tractor should be inspected by your authorized dealer periodically or at least once a year, depending on its hours of use.

When in need of parts, always specify the model number, and the chassis and engine serial numbers (including the prefix and suffix letters). Write these serial numbers in the space provided on this page.

Should you have difficulties with the unit, consult your authorized dealer. **UNDER NO CIRCUMSTANCES SHOULD YOU ATTEMPT TO SERVICE THESE UNITS YOURSELF.** Only your dealer is authorized, under the terms of the warranty, to repair or replace drive components of the unit. Should you desire additional information not found in this manual, contact your authorized *Cub Cadet* dealer.

SERIAL NUMBER LOCATION



NOTE

References to LEFT and RIGHT indicate that side of the tractor when facing forward while seated in the drivers seat. Reference to FRONT indicates the grille end of the tractor; to REAR, the drawbar end.

The chassis serial number plate is on the left side of frame under the running board (Refer to Figure 1).

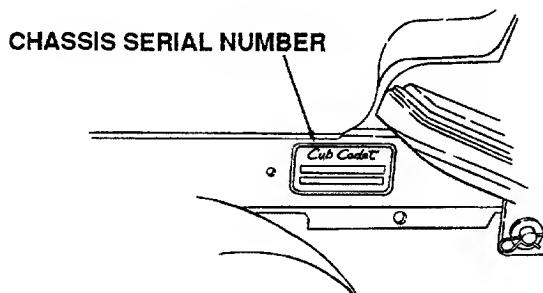


Figure 1

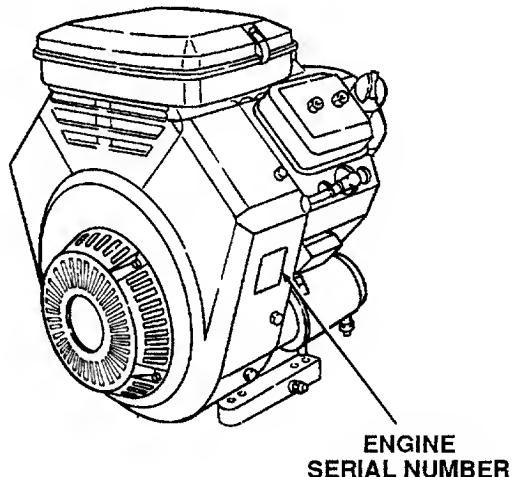


Figure 2

MODEL _____

CHASSIS SERIAL NO. _____

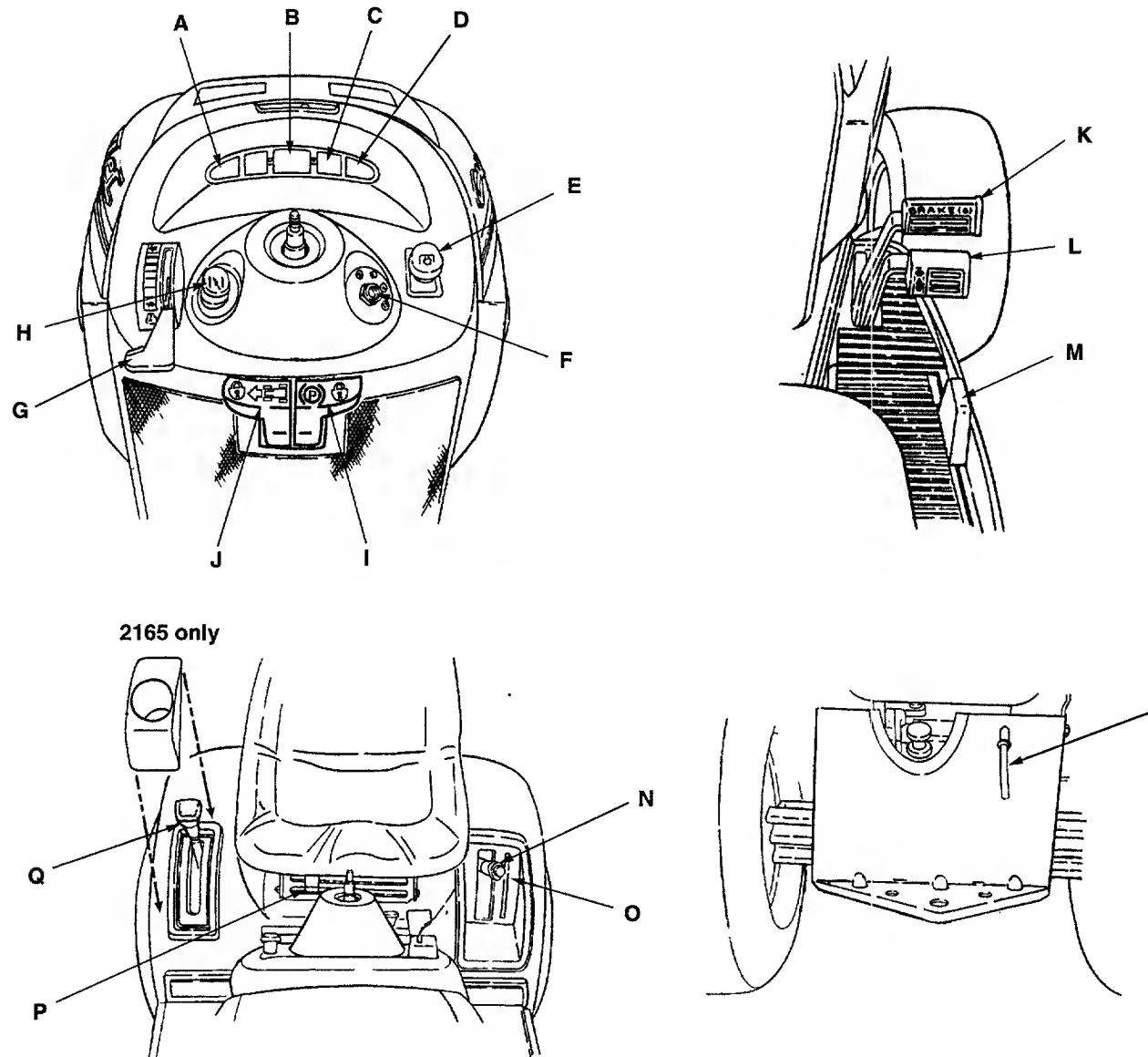
DELIVERY DATE _____

ENGINE SERIAL NO. _____

SECTION I. CONTROLS AND INDICATORS

Your Cub Cadet Tractor has been safety engineered. Thoroughly acquaint yourself with all the controls and

indicators before attempting to start or operate the tractor.



- A. Low Oil Indicator
- B. Hour Meter
- C. Clutch Engagement Indicator
- D. Amp Indicator
- E. Power Take-Off (PTO) Control Switch
- F. Ignition/Light Switch
- G. Throttle Control Lever
- H. Choke Control
- I. Brake Pedal Lock
- J. Cruise Control Lever

- K. Brake Pedal
- L. Forward Control Pedal
- M. Reverse Control Pedal
- N. Lift Handle
- O. Lift Height Indicator
- P. Seat Adjustment Lever
- Q. Speed Control Lever (2160 only)
- R. Transmission Release Lever (2165 only)
- S. Fuses (Not Shown)
- T. Safety Interlock Switches (Not Shown)

Figure 3

A. LOW OIL INDICATOR



CAUTION

Operating the tractor with low oil level or pressure could result in severe engine damage.

This indicator will illuminate when the engine oil level is low. If this indicator illuminates, stop the tractor immediately and check the engine oil level. If the oil level is within the operating range, but the light remains on, contact your *Cub Cadet* dealer.

B. HOUR METER

The hour meter operates whenever the ignition key is in the "ON" position. Record the actual hours of tractor operation to ensure all maintenance procedures are completed according to the schedule in this manual.

C. CLUTCH ENGAGEMENT INDICATOR (2160 only)

This indicator is illuminated at all times, EXCEPT when the **forward control pedal** is fully depressed. If the light comes on while driving **forward**, depress the control pedal completely. If the light stays on with the pedal fully depressed, contact your *Cub Cadet* dealer.

D. AMP INDICATOR

This indicator will illuminate when the tractor's voltage sensor reads low battery voltage. If the light stays on, contact your *Cub Cadet* dealer.

E. POWER TAKE-OFF (PTO) CONTROL SWITCH

The power take-off control switch operates the front electric PTO clutch. Pull the switch knob to engage ("RUN"), or push the knob to disengage ("OFF") the PTO clutch.

F. IGNITION/LIGHT SWITCH



WARNING

To prevent accidental starting and/or battery discharge, remove the key from the ignition switch when the tractor is not in use.

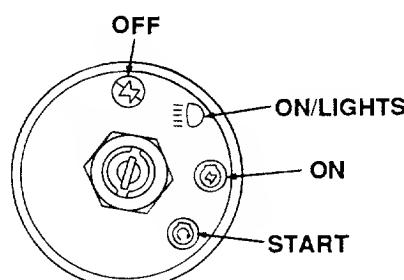


Figure 4

The combination lights and ignition switch is a four position switch. (See Figure 4).

G. THROTTLE CONTROL LEVER

This lever controls the speed of the engine. When set in a given position, the control cable will maintain a uniform engine speed.



NOTE

When using power take-off operated equipment, best performance is achieved with the throttle lever in the "FAST" position.



This symbol shows slow position.



This symbol shows fast position.

H. CHOKE CONTROL

The choke control is operated manually. Pull the knob out to choke the engine; push the knob in to open the choke.

I. BRAKE PEDAL LOCK



WARNING

The hydrostatic transmission (Model 2165) will not hold the tractor on a hill. Normal internal leakage in the transmission will allow the tractor to roll downhill. To avoid an accident and/or possible injury, engage the brake pedal lock.

The brake lock lever, located in the center of the dash panel below the steering wheel, is identified with the **(P)** symbol. Always engage the brake pedal lock when dismounting the tractor. To engage the brake pedal lock, depress the brake pedal and push down on the brake pedal lock lever. Hold the lever down while releasing the brake pedal. The lever should lock in the down position.

J. CRUISE CONTROL LEVER

The cruise control lever, located in the center of the dash panel below the steering wheel, is identified with the  symbol. This lever can be used to maintain a desired "foot free" **forward speed** in areas where constant speed changes are not required.

K. BRAKE PEDAL

The brake pedal is located at the front of the right running board above the forward control pedal. Press down to stop the tractor and disengage the cruise control. The brake pedal must be fully depressed to activate the safety interlock switch when starting the tractor.

L. FORWARD CONTROL PEDAL

The forward control pedal is located at the front of the right running board below the brake pedal:

Model 2160 — Slowly press down on the pedal until **fully depressed** to drive in the forward direction. The *clutch engagement indicator* (C) will light whenever the control pedal is not fully depressed.

Model 2165 — Slowly press down on the pedal to start moving forward. The forward ground speed of the tractor is directly affected by the distance the pedal is depressed.

M. REVERSE CONTROL PEDAL



WARNING

Check behind the tractor to be sure the area is clear of people, pets or obstacles. Use a slower speed to maintain control of the tractor when traveling in reverse.

The reverse control pedal is located in the right front running board, rearward of the the brake and forward control pedals. Press the pedal downward to move in reverse.

N. LIFT HANDLE

The lift handle is located in the left fender and is used to raise and lower equipment used with the tractor. The equipment can be set in any of six positions by depressing the top button on the handle, moving the handle to the desired position, then releasing the button. It may be necessary to push or pull slightly on the handle to depress the button. There is a lift assist spring which reduces the effort needed to lift attachments. To adjust spring tension refer to **ADJUSTMENTS** in Section III.

O. LIFT HEIGHT INDICATOR

The lift height indicator is located in the left fender and indicates the height of the deck attachment when installed.

P. SEAT ADJUSTMENT LEVER

The seat adjustment lever (see Figure 5) is used to move the seat forward or rearward into one of five positions. See **ADJUSTING THE SEAT** in section III.

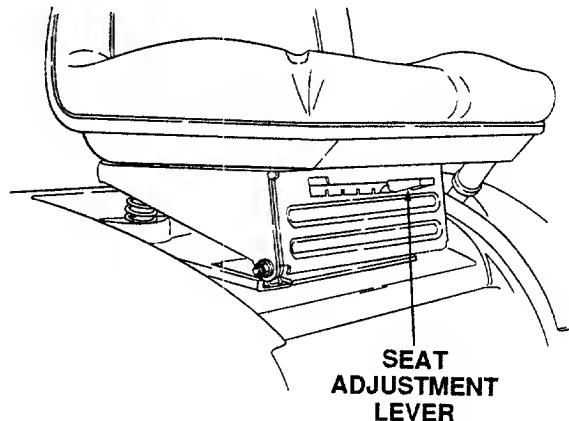


Figure 5

Q. SPEED CONTROL LEVER (2160 only)

The speed control lever is located in the right fender and is used to shift into any one of the six gear speeds in the forward and reverse directions.

Shifting the speed control lever to a higher gear setting (higher number on shift cover) provides increased forward and reverse speeds. The speed control lever **cannot** be shifted when either the forward or reverse control pedals are depressed.

R. TRANSMISSION RELEASE LEVER (2165 only)

The transmission release lever is located at the back of the tractor in the rear drawbar. This lever disconnects the hydro transmission pump from the rear axle to allow the unit to be pushed a short distance by hand.

To disengage the transmission, pull back on the lever until its locking flange is visible outside the drawbar, then lift the lever up into the slot and release. To re-engage the transmission, pull back on the lever, drop out of the slot and release.

S. FUSES

The fuses are located under the hood on the back of the indicator lamp housing of the dash panel (see Figure 6). Fuses are installed to protect the tractor's electrical circuitry and components from damage caused by excessive amperage.

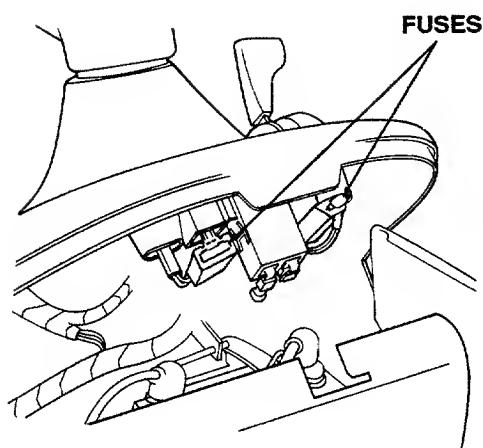


Figure 6. Model 2165 Shown.

T. SAFETY INTERLOCK SWITCHES

This tractor is equipped with a safety interlock system for the protection of the operator. If the interlock system should ever malfunction, do not operate the tractor. Contact your authorized *Cub Cadet* Dealer. The safety interlock system prevents the engine from cranking or starting unless the brake pedal is fully depressed, and the PTO switch is in the "OFF" position.

The safety interlock system will automatically shut off the engine if the operator leaves the seat before engaging the brake lock.

The safety interlock system will automatically shut off the engine if the operator leaves the seat with the PTO in the "RUN" position, regardless of whether the brake lock is engaged. The PTO switch must be moved to the "OFF" position to restart the engine.

The safety interlock system will automatically shut off the PTO if the *reverse control pedal* is depressed with the PTO in the "RUN" position. To re-engage the PTO, release the reverse control pedal, move the PTO switch to the "OFF" position, then again pull the switch to the "RUN" position.

FUEL TANK

The fuel tank is located under the rear fender. The filler cap is in the center/rear of the fender (see Figure 7).

HOOD AND SIDE PANELS

The tractor hood is arranged to swing up and forward for easy access to the engine compartment (see Figure 8). Whenever engine maintenance is required, the side panels can be removed.

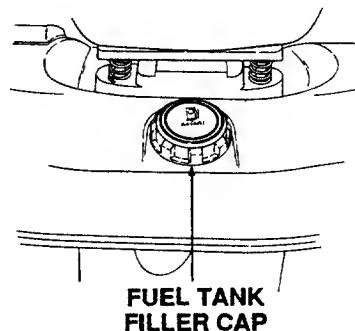


Figure 7

WARNING

If the engine has been recently run, the engine, muffler and surrounding metal surfaces will be hot and can cause burns to the skin. Allow the tractor to cool and use caution when removing the side panels.

To remove either the right or left side panel, refer to Figure 8 and proceed as follows:

1. Engage the brake lock and raise the hood.
2. Loosen, but do not remove, the rear wing nut and upper front wing nut.
3. Grasp the side panel just behind the grille and pull outward to release the side panel from the tapered bushings on the grille.
4. Slide the side panel forward and out of the slot in the dash panel.

To install either the right or left side panel, refer to Figure 8 and proceed as follows:

1. Slide the rear of panel into the groove in the dash panel.
2. Position the notch of the rear side panel tab on the threads of the bulkhead rod, between the bulkhead and wing nut.
3. Press the slots of the front side panel flange onto the tapered retainers, between the retainers and the grille.
4. Tighten the rear and upper front wing nuts and close the hood.

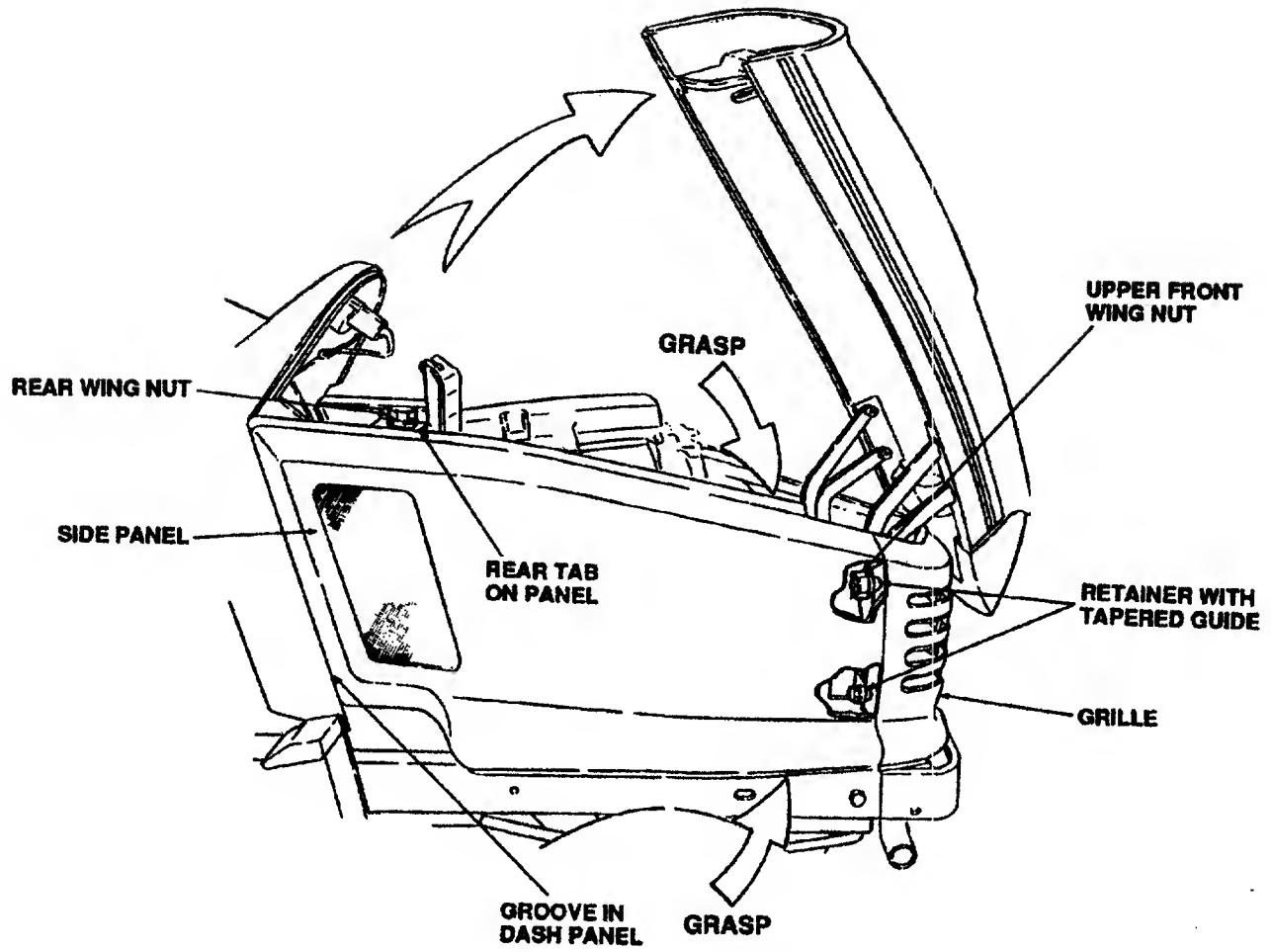


Figure 8

SECTION II. OPERATION



WARNING

RECEIVE INSTRUCTION - Read the operator's manual. Learn to operate this machine SAFELY. Don't risk INJURY or DEATH.

1. Before starting the engine or beginning operation, be familiar with the controls. The operator must be seated, the PTO switch in the "OFF" position and the brake pedal fully depressed.
2. Keep all shields in place. Keep away from moving parts.
3. NO RIDERS! Keep all people and pets a safe distance away. Look behind to both sides before backing up.
4. DO NOT direct the mower discharge at people.
5. Avoid slopes. Tractors can be rolled over.
6. Before leaving the operator's seat: Shut off the PTO, engage the brake pedal lock, shut off the engine and remove the ignition key. Wait for all movement to stop before servicing or cleaning.
7. Do not fill the fuel tank when the engine is running or while the engine is hot. Tighten the fuel cap securely.

BEFORE OPERATING YOUR TRACTOR

1. Before you operate the tractor, study this manual carefully. It has been prepared to help you operate and maintain your tractor with utmost efficiency.
2. Familiarize yourself with the operations of all the instruments and controls.
3. This engine is certified to operate on unleaded gasoline. Fill the fuel tank with only clean, fresh, unleaded gasoline with a minimum of 85 octane. Do not mix oil with gasoline. Purchase fuel in a quantity that can be used within 30 days to assure fuel freshness.

In countries other than the U.S.A., leaded gasoline may be used if it is commercially available and unleaded is not available.



NOTE

Some fuels, called oxygenated or reformulated gasolines, are gasoline blended with alcohols or ethers. Excessive amounts of these blends can damage the fuel system or cause performance problems. Do not use gasoline which contains Methanol. If any undesirable operating symptoms occur, use gasoline with a lower percentage of alcohol or ether.

4. Check the engine and transmission oil levels.
5. Clean the air cleaner element if necessary.
6. Check the tire inflation pressures.
7. Adjust the seat for operator's maximum comfort, visibility and for maintaining complete control of the tractor.
8. Remove the side panels and clean any accumulated grass and debris from the engine air inlet screen. Also clean the dash air intake screen, grille and side panels to ensure adequate cooling.
9. Refer to the various sections of the Owner's Manual for additional information.

STARTING THE ENGINE



WARNING

Do not operate the tractor if the interlock system is malfunctioning. It is a safety device designed for the protection of the operator.



WARNING

For personal safety, the operator must be sitting in the tractor seat before starting the tractor.



NOTE

This unit is equipped with a safety interlock system for the protection of the operator.

The safety interlock system prevents the engine from cranking or starting unless the brake pedal is fully depressed and the PTO clutch engagement switch is in the "OFF" position.

The safety interlock system will automatically shut off the engine if the operator leaves the seat before engaging the brake pedal lock.

→ NOTE

The safety interlock system will automatically disengage the PTO if the reverse control pedal is pressed down with the PTO in the "RUN" position. To re-engage the PTO, release the reverse control pedal, move the PTO switch into the "OFF" position and then engage the PTO while seated.

→ NOTE

The safety interlock system will automatically shut off the tractor engine if the operator leaves the seat with the PTO in the "RUN" position.

1. Operator must be sitting in the tractor seat.
2. Pull choke control knob to full choke position. Less choking may be necessary due to variations in temperature, grade of fuel, etc. Little or no choking will be needed when the engine is warm.
3. Place the throttle midway between the "SLOW" and "FAST" position.
4. Place the PTO switch in the "OFF" position.
5. Fully depress the brake pedal.
6. Turn the ignition key clockwise to the "START" position and release it as soon as the engine starts; however, do not crank the engine continuously for more than 10 seconds at a time. If the engine does not start within this time, turn the key "OFF" and wait a minute to allow the engine's starter motor to cool, then try again.
7. After the engine starts, slowly release the brake pedal. As the engine warms up, gradually push the choke control knob all the way in. Do not use the choke to enrich the fuel mixture, except as necessary to start the engine.

→ NOTE

This engine is designed to give maximum performance and service life if operated with

the choke fully open and the throttle in the "FAST" position. To open the choke fully requires an engine warmup period of several seconds to several minutes, depending on the outdoor temperature.

After starting the engine, push in the choke control until the engine begins to run smoothly. As the engine warms and begins to run roughly, continue to push in the choke control as necessary to keep the engine running smoothly until the choke is fully depressed. Operating equipment during engine warmup is not recommended.

STOPPING THE ENGINE

! CAUTION

Remove the key from the ignition switch to prevent accidental starting or battery discharge if the equipment is left unattended.

Place the PTO switch in the "OFF" position. Move the throttle control lever to the "SLOW" position and allow the engine to idle for a short time before stopping. Then turn the ignition key to the "OFF" position. Remove the key from the ignition switch.

TRACTOR BREAK-IN PROCEDURE

! CAUTION

Never operate a new engine immediately under full load. Break it in carefully as shown in the table below.

Period	Engine Throttle Control Lever Position			Load
	1/2	3/4	Full	
1st hour	X			None
2 hour		X		Light drawbar load or Mowing with tractor at slow speed
3rd through 13th hour		X		Medium drawbar load or Normal mowing

COLD WEATHER STARTING



WARNING

Engine exhaust gases are dangerous. Do not run the engine in a confined area such as a storage building any longer than is necessary. Immediately move the tractor outdoors.



WARNING

For personal safety, the operator must be sitting in the tractor seat before starting the tractor.

When starting the engine at temperatures near or below freezing, ensure the correct viscosity motor oil is used in the engine and the battery is fully charged. Start the engine as follows:

1. Pull the choke all the way out to full choke position.
2. Move the throttle control lever to midway between the "SLOW" and "FAST" position.
3. Place the PTO switch in the "OFF" position.
4. Fully depress the brake pedal.
5. Turn the ignition key to the "START" position and hold until the engine starts; however, do not crank the engine continuously for more than 10 seconds at a time. Once the engine starts, gradually adjust the choke as needed to keep the engine running until warmed up, then push the choke control all the way in.



NOTE

If the engine fails to start after several attempts, the engine may become flooded. If this happens, wait a minute to allow the starter motor to cool. Move the throttle control to the "SLOW" position, push the choke in all the way and momentarily crank the engine to help clear the cylinders. With the throttle control in the "SLOW" position and the choke all the way in, turn the ignition key to the "START" position while slowly pulling the choke out to a position that will allow the engine to start. Gradually adjust the choke as needed to keep the engine running until warmed up, then push the choke control all the way in.

DRIVING THE TRACTOR (Model 2160)



CAUTION

Avoid sudden starts, excessive speed and sudden stops.



CAUTION

Do not leave the seat of the tractor without disengaging the PTO, depressing the brake pedal and engaging the brake pedal lock. If leaving the tractor unattended, also turn the ignition key off and remove the key.



NOTE

When using power take-off operated equipment, best performance is achieved with the throttle lever in the "FAST" position. When using front or rear mounted equipment, refer to the Equipment Owner's Manual for the proper ground speed.

1. Depress the brake pedal to release the brake pedal lock and let the pedal up. Move the throttle lever to the position where the engine operates best for the load to be handled (normally full throttle).
2. Shift the speed control lever to the desired gear setting.



CAUTION

When driving the tractor in the forward direction, the forward control pedal **must always be fully depressed**. Illumination of the *clutch engagement indicator light* on the dash panel indicates the pedal is not completely depressed. Driving the tractor with the control pedals partially depressed can cause premature internal wear and eventual failure of the tractor's drive clutch assembly.

3. Driving with forward or reverse pedals.



CAUTION

Do not use the forward or reverse control pedals to change the direction of travel when

the tractor is in motion. Use the brake pedal to bring the tractor to a stop before depressing either the forward or reverse control pedal.

- a. To move forward, slowly depress the forward control pedal until **completely depressed**.
- b. To move in reverse, check that the area behind is clear then fully depress the reverse control pedal.

4. Using the cruise control lever.

NOTE

The cruise control feature can only be operated in the forward direction.

- a. Slowly depress the forward control pedal until fully depressed..
- b. Lightly push the cruise control lever downward as far as possible and hold in this position.
- c. While continuing to hold the cruise lever down, lift your foot from the forward control pedal (you should feel the cruise latch engage).
- d. If properly engaged, the cruise lever and forward control pedal should lock in the down position, and the tractor will maintain its forward speed.
- e. Disengage the cruise control using one of the following methods:
 - Depress the brake pedal to disengage the cruise control and stop the tractor.
 - Depress the forward control pedal.
 - Lift the cruise control lever upward.

NOTE

Although not recommended, depressing the reverse pedal will also disengage the cruise control.

- f. To change to the reverse direction when operating with cruise control, depress the brake pedal to disengage the cruise control and stop the tractor; then depress the reverse control pedal.
5. To change ground speed of the tractor while it is in motion, release the forward or reverse control pedal and depress the brake pedal to stop the tractor (also disengaging the cruise control). The speed control lever can then be shifted to the desired gear setting, and the appropriate control pedal depressed to continue travel.

DRIVING THE TRACTOR (Model 2165)

CAUTION

Avoid sudden starts, excessive speed and sudden stops.

CAUTION

Do not leave the seat of the tractor without disengaging the PTO, depressing the brake pedal and engaging the brake pedal lock. If leaving the tractor unattended, also turn the ignition key off and remove the key.

NOTE

When using power take-off operated equipment, best performance is achieved with the throttle lever in the "FAST" position. When using front or rear mounted equipment, refer to the Equipment Owner's Manual for the proper ground speed.

1. Depress the brake pedal to release the brake pedal lock and let the pedal up. Move the throttle lever to the position where the engine operates best for the load to be handled (normally full throttle).
2. Driving with forward or reverse pedals.

CAUTION

Do not use the forward or reverse control pedals to change the direction of travel when the tractor is in motion. Use the brake pedal to bring the tractor to a stop before depressing either the forward or reverse control pedal.

- a. To move forward, slowly depress the forward control pedal until the desired speed is achieved.
- b. To move in reverse, check that the area behind is clear then fully depress the reverse control pedal.

3. Using the cruise control lever.

NOTE

The cruise control feature can only be operated in the forward direction.

- a. Slowly depress the forward control pedal until the desired speed is achieved.

- b. Lightly push the cruise control lever downward as far as possible and hold in this position.
- c. While continuing to hold the cruise lever down, lift your foot from the forward control pedal (you should feel the cruise latch engage).
- d. If properly engaged, the cruise lever and forward control pedal should lock in the down position, and the tractor will maintain the same forward speed.
- e. Disengage the cruise control using one of the following methods:
 - Depress the brake pedal to disengage the cruise control and stop the tractor.
 - Lightly depress the forward control pedal.
 - Lift the cruise control lever upward.

NOTE

Although not recommended, depressing the reverse pedal will also disengage the cruise control.

- f. To change to the reverse direction when operating with cruise control, depress the brake pedal to disengage the cruise control and stop the tractor; then depress the reverse control pedal.

DRIVING ON SLOPES

Refer to the SLOPE GAUGE on page 47 to help determine slopes where you may not operate safely.



WARNING

Do not mow on inclines with a slope in excess of 15 degrees (a rise of approximately 2-1/2 feet every 10 feet). The tractor could overturn and cause serious injury.



WARNING

Operate the tractor up and down slopes, never across slopes. Always drive up or down the face of a slope. Do not drive so that the tractor may tip over sideways.

Before operating the tractor on any slope, walk the slope to look for possible hazards such as rocks, mounds, ruts, stumps or other surface irregularities which could cause the tractor to be upset.

Back the tractor with implement up the steepest portion of each slope you intend to work. If the tractor cannot negotiate the slope in reverse, the slope is too steep to be worked.

Avoid turns when driving on a slope. If a turn must be made, turn **down** the slope. Turning up a slope greatly increases the chance of a roll over.

Avoid stopping when driving up a slope. If it is necessary to stop while driving up a slope, start up smoothly and carefully to reduce the possibility of flipping the tractor over backward.

STOPPING THE TRACTOR



CAUTION

Always engage the brake pedal lock, push the PTO switch to the "OFF" position, lower the equipment and shut off the engine before dismounting. Never try to start the engine while standing on the ground.

Fully depress the brake pedal to bring the tractor to a complete stop (and disengage the cruise control), engage the brake pedal lock, disengage the PTO, turn the ignition switch to "OFF" and remove the key from the switch before dismounting.

OPERATING THE POWER TAKE-OFF (PTO) CLUTCH

Before operating the new clutch under load (mowing grass, etc.), perform the following break-in procedure:

1. Start and run the engine a few minutes to warm up.
2. With the mowing deck, snow thrower, etc. installed and the engine running at approximately 50% throttle, engage and disengage the clutch at ten second intervals (ten seconds ON-ten seconds OFF) five times. The engine choke may have to be pulled out slightly to accomplish this.
3. Increase the engine speed to 75% throttle and again engage and disengage the PTO clutch at ten second intervals five times.
4. Make certain the PTO is disengaged and stop the engine.

Operate the PTO clutch as follows:

1. Move the throttle control lever to approximately the mid throttle position.
2. Pull the PTO switch to the "RUN" position.

3. Advance the throttle lever to the operating speed (full engine speed).
4. The operator must remain in the tractor seat at all times. If the operator should leave the seat without turning off the power take-off switch, the tractor's engine will shut off.
5. The PTO clutch cannot be operated when the tractor is driving in the reverse direction. The PTO switch must be in the "OFF" position when the reverse control pedal is depressed, or the PTO clutch will automatically disengage. To re-engage the PTO clutch, release the reverse control pedal, move the PTO switch to the "OFF" position, then again pull the switch to the "RUN" position.

DRAWBAR

Drawbar type equipment must be hitched to the tractor only at the hitch hole in the drawbar (See Figure 9).

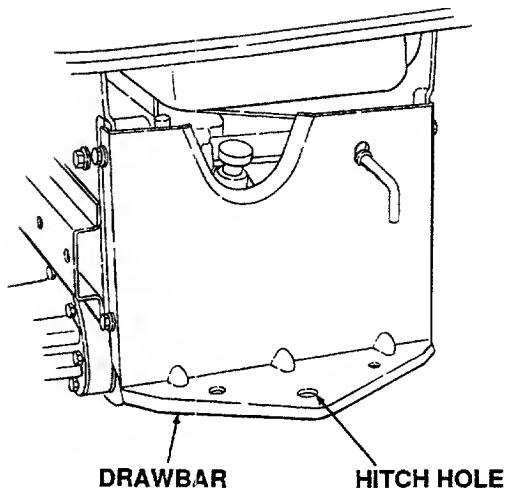


Figure 9

SECTION III. ADJUSTMENTS

ADJUSTING THE SEAT



WARNING

Do not adjust the seat when the tractor is moving. Adjusting the seat while the tractor is moving could cause the operator to lose control of the tractor.

Before starting the tractor, adjust the seat forward or rearward to the most comfortable driving position. To reposition the seat, move the seat adjustment lever (see Figure 10) upward and slide the seat forward or rearward. Release the adjustment lever when the seat is comfortably positioned. Gently rock the seat forward and rearward once to be sure the seat is locked in place.

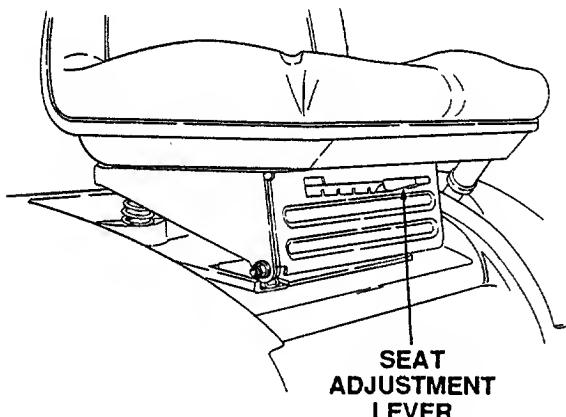


Figure 10

ADJUSTING THE POWER TAKE-OFF CLUTCH



WARNING

To avoid possible injury, disengage the PTO, engage the the brake pedal lock, and turn the ignition to the "OFF" position before working on the tractor.

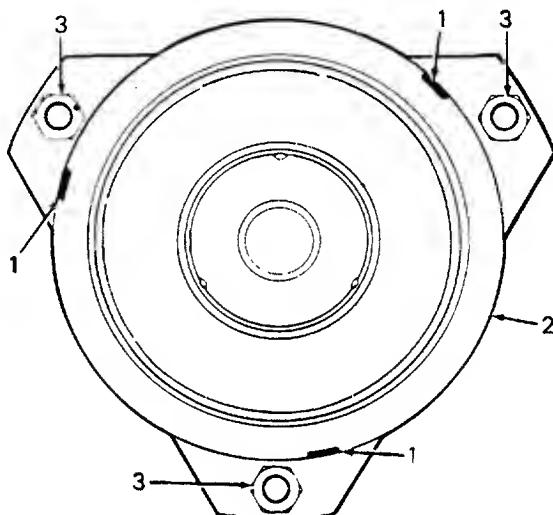


WARNING

The clutch may be HOT. Allow the engine, clutch and surrounding metal surfaces to cool before adjusting the clutch.

The clutch is factory adjusted and should not require further adjustment under normal operating conditions. However, if the clutch fails to operate properly, check the adjustment as follows:

Using a feeler gauge, check the air gap. Referring to Figure 11, insert an appropriate (.012 to .017) feeler gauge into each of the three access slots located around the outside of the brake plate. The air gap should be between .012 and .017 inch. Adjust the self-locking nuts as necessary to obtain an equal air gap, within this range, at all three access slots.



1. Access Slots
2. Brake Plate
3. Self-Locking Nuts

Figure 11

ADJUSTING THE BRAKES

During normal operation of this tractor, the brakes are subject to wear and will need periodic examination and adjustment.

To check the brake adjustment, position the tractor on a firm and level surface. Stop the tractor engine and remove the ignition key. On Model 2165, pull and lock the transmission release lever in the "TRANSMISSION RELEASED" position. Perform the following checks:

1. Engage the brake pedal lock. If the tractor can be pushed forward or rearward, the braking force must be increased.

- Release the brake pedal lock. If the tractor cannot be pushed forward or rearward, the braking force must be decreased.

ADJUSTING THE BRAKE ROD

To increase or decrease the braking force, refer to Figure 12 and proceed as follows:

- Place the tractor on a level surface with the brake pedal lock disengaged. Stop the tractor engine and remove the ignition key.
- While working from the underside of the tractor, remove the hairpin cotter from the brake rod adjustment ferrule. Remove the ferrule from the brake cam.
- To increase the braking force—
Turn the ferrule clockwise (inward) one full turn at a time until the ferrule can be inserted into the brake cam while applying a **minimal tension** on the spring.

To decrease the braking force—

Turn the ferrule counterclockwise (outward) one full turn at a time until the ferrule can be inserted into the brake cam while applying a **minimal tension** on the spring.

- Turn the ferrule counterclockwise (outward) one full turn to release the slight spring tension, then insert the ferrule into the brake cam and secure with the hairpin cotter.

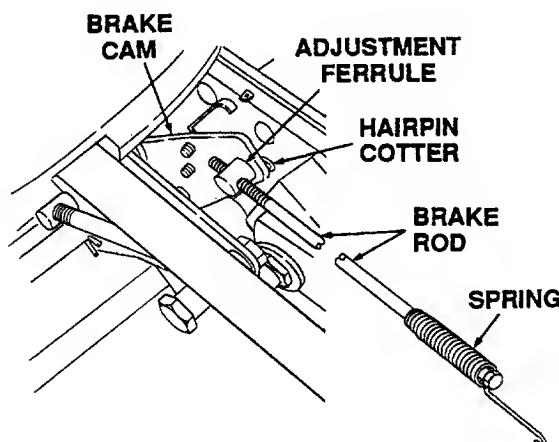


Figure 12

Recheck the brake adjustment to ensure proper brake operation before operating the tractor. If brake rod adjustment does not correct the problem, see your authorized *Cub Cadet* dealer.

WHEEL ALIGNMENT

The front wheels should toe-in approximately 1/8 to 1/4 inch, as measured across dimensions A and B shown in Figure 13.

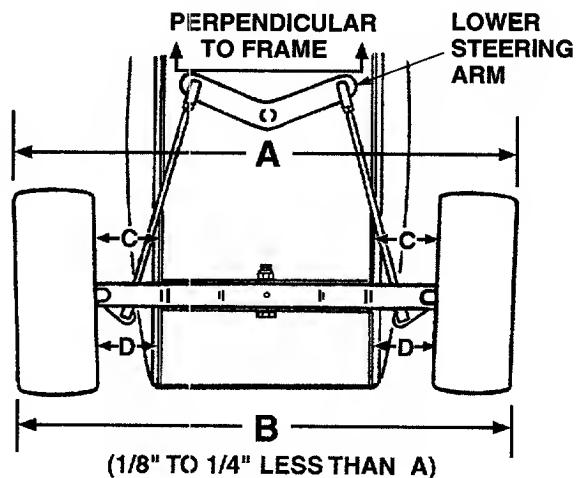


Figure 13. Viewed from beneath the tractor.

FRONT WHEEL ADJUSTMENT



WARNING

Place the tractor on a firm and level surface.

To adjust the toe-in, disconnect the front ball joints from the steering arms by removing the hex lock nuts (Refer to Figure 14) and proceed as follows:

- Check the lower steering arm to ensure it is perpendicular to the tractor frame (See Figure 13).
- Place a mark at the same spot on both front wheels; preferably the inner bead flange of the wheel rims.
- Rotate the wheels to position the marks at the front *horizontal* diameter of the wheels, then measure the distance between the marks and the bottom edges of the tractor frame channels (See measurement D in Figure 13). These two measurements should be equal.
- Rotate the marks to the rear *horizontal* diameter and measure the distance between the marks and the frame (See measurement C in Figure 13). Measurement D should be approximately 1/16 to 1/8 inch less than measurement C on each side of the tractor.

- Manually move each wheel to achieve the required toe-in *and* equal D measurements.
- Loosen the jam nuts from the ball joints (See Figure 14).

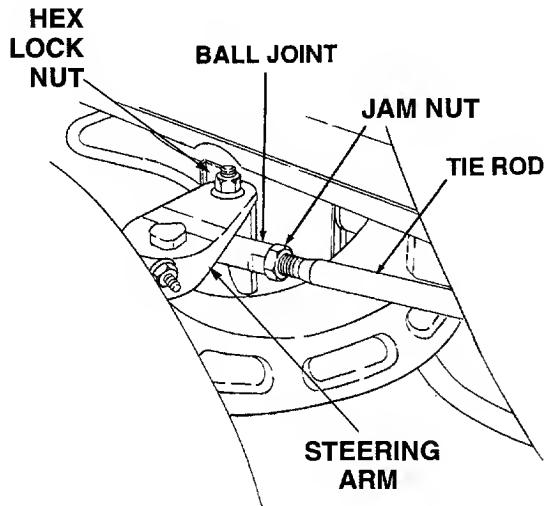


Figure 14

- Making sure not to move the lower steering arm or either wheel, turn the ball joint in or out on each tie rod as necessary to align with the hole in each steering arm.
- Reinstall the ball joints in the steering arms and secure with the hex lock nuts. Tighten the jam nuts against the ball joints.

PIVOT BAR ADJUSTMENT



CAUTION

The tractor should be checked every 50 hours of operation for play between the frame axle channel and the pivot axle.

Check and adjust the pivot axle as follows:

- Raise the front of the tractor and set it on jack stands, so the front wheels are suspended above the ground.



CAUTION

For safety, block the rear wheels to prevent the tractor from rolling and tipping or sliding the jack stands.

- Pivot the ends of the axle up and down to check for binding. If the axle is binding, loosen the lock nuts (See Figure 15) until binding is eliminated.

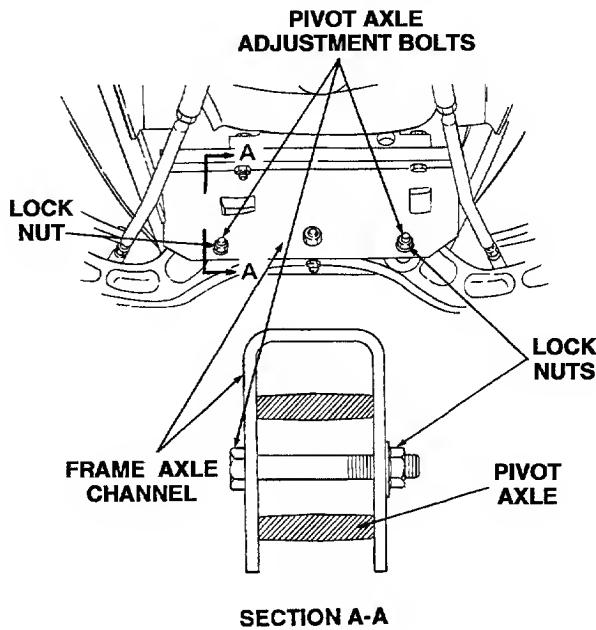


Figure 15

- Grasping the ends of the pivot axle, attempt to move each end of the axle forward and rearward to check for side play between the axle and frame channel. If play is present, gradually tighten the lock nuts until play is minimized.
- Repeat steps 2 and 3 until minimum play without binding is achieved.
- Raise the front of the tractor, remove the jack stands, and lower the tractor to the ground. Remove the blocks from the rear wheels.

NEUTRAL ADJUSTMENT

The Models 2160 (gear drive) and 2165 (hydrostatic drive) use essentially the same transmission control linkage. The control linkage is adjusted at the factory and normally does not require any further adjustment. However, if the tractor creeps forward or rearward when neither the forward nor reverse pedals are depressed, the following inspection and adjustments will be necessary.



NOTE

Only the Model 2165 hydro transmission is pictured in Figure 16. However, the components referred to in the figure also apply for the Model 2160.

1. Front Control Rod
2. Rear Control Rod
3. Hex Tap Screw
4. Pivot Sleeve
5. Neutral Arm
6. Control Arm
7. Hex Cap Screw
8. Centering Spacer
9. Neutral Bracket
10. Hairpin Cotter
(Not Shown)

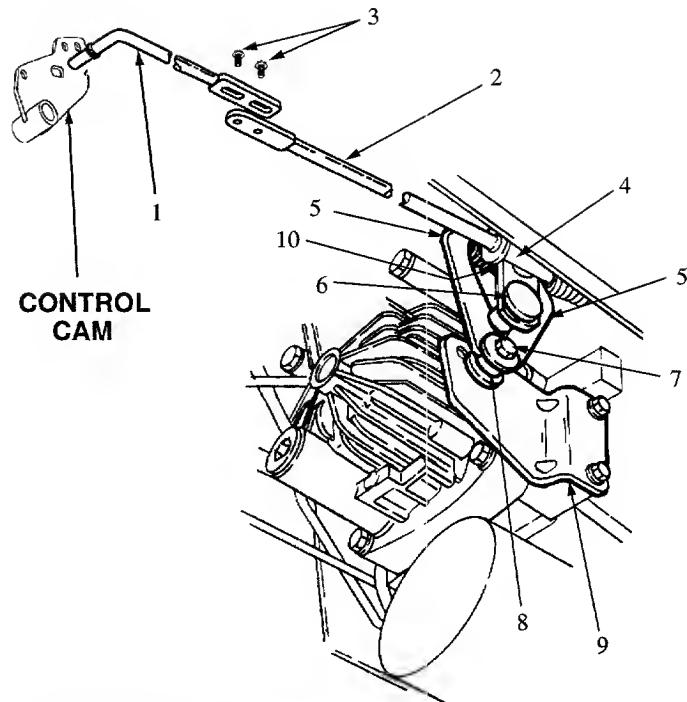


Figure 16. Model 2165 Shown.

Checking the Transmission Neutral Setting

To check and adjust the transmission neutral setting, proceed as follows:

1. Drive the tractor for approximately 5-10 minutes to warm up the transmission, then stop the engine and engage the parking brake.



WARNING

Place the tractor on a firm and level surface and chock the front wheels before raising the rear wheels from the ground. Use jack stands to support the rear of the tractor when raised.

2. Raise the rear of the tractor, so that the rear tires are at least one inch above the surface, and set it on jack stands. Make certain the jack stands are positioned to balance the tractor and prevent tipping.



WARNING

The operator presence safety circuit will stop the engine if the seat is empty when the brake pedal is released. If an assistant is seated when adjusting the neutral setting, use extreme caution to prevent the tractor from tipping or rolling. Similar precautions should be taken with any other method of over-riding the safety circuit, such as placing a weight in the seat. Never operate the tractor with the safety circuit disabled.

3. Carefully start the tractor engine and release the parking brake. Observe both rear wheels for rotation in either direction.
4. If wheel rotation is observed, adjust the neutral setting as follows:
 - a. Disconnect the rear control rod from the control arm by removing the hairpin cotter from the pivot sleeve (Refer to Figure 16).
 - b. If wheel rotation stops when the rod is disconnected, check and readjust the control rod per the instructions below.
 - c. If wheel rotation continues, loosen the locknut securing the hex cap screw and centering spacer to the neutral bracket (See Figure 16).
 - d. If the rotation is in the *forward* direction, slide the centering spacer rearward until the wheels just begin to rotate in the *reverse* direction. Then slowly slide the spacer slightly forward until wheel rotation stops.
 - e. If the rotation is in the *reverse* direction, slowly slide the centering spacer slightly forward until rotation stops.
 - f. Carefully tighten the hex cap screw and locknut, making certain the centering spacer does not move.
 - g. Stop the engine and **engage the parking brake**.

Adjusting the Control Rod

Adjust the control rod (See Figure 16) as follows:

NOTE

The brake pedal lock MUST be engaged to properly adjust the control rod.

1. Loosen, but do not remove, the hex tap screws that fasten the front and rear control rods together.
2. While making certain to not move the front control rod, control cam or control arm (See Figure 16), slide the rear control rod in the direction necessary to directly align the pivot sleeve pin with the appropriate hole (upper hole for 2160 - lower for 2165) of the control arm.
3. Insert the pivot sleeve pin into the control arm and secure with the hairpin cotter, then tighten the hex tap screws. Make sure to maintain the adjusted position of the control rods when tightening the screws.
4. Raise the rear of the tractor, remove the jack stands and lower the tractor.

ADJUSTING LIFT ASSIST SPRING TENSION

The effort required to operate the implement lift handle can be varied by loosening or tightening the lift assist spring adjusting bolt (See Figure 17). The bolt can be accessed from the rear of the tractor, inside the left rear wheel. Turning the adjusting bolt clockwise will decrease the manual effort required for lifting attachments; turning counterclockwise will increase the effort needed to lift the attachment.

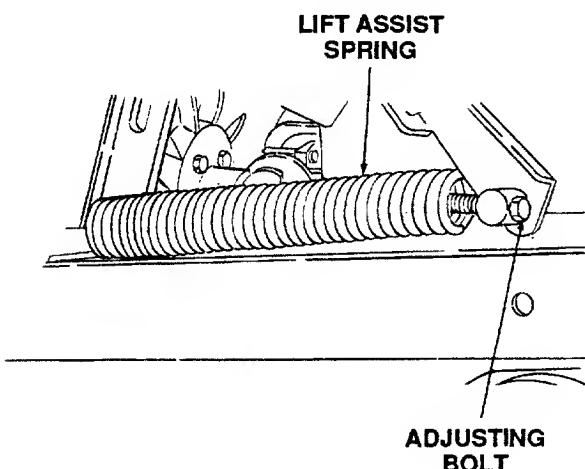


Figure 17

CARBURETOR ADJUSTMENTS

WARNING

When making adjustments to the carburetor while the engine is running, disengage the PTO clutch and engage the brake pedal lock. Keep clear of all moving parts and be careful of all hot surfaces.

WARNING

Carbon monoxide fumes can be fatal! Do not make any adjustments to the carburetor in a confined area such as a storage building. Move the tractor outside into the air.

The carburetor is adjusted at the factory and under normal operating conditions it will not require readjusting. The high idle is set at the factory and cannot be adjusted. If the engine does not operate properly and the problem appears to be fuel system related, check the following areas before adjusting the carburetor: Refer to **MAINTENANCE** section.

- Check for fuel in fuel tank
- Check fuel cap vent for blockage
- Check fuel line for pinched or obstructed areas
- Check for fuel filter blockage
- Check for a clogged air filter

If, however, the engine is hard-starting or runs roughly or stalls at low idle speed, it may be necessary to adjust or service the carburetor. Minor carburetor adjustment may also be needed to compensate for differences in fuel, temperature or altitude.

The air filter element and cover plate must be assembled to the carburetor when running the engine.

NOTE

Carburetor adjustments should be made only after the engine has warmed up.

Adjust the carburetor idle fuel mixture as follows:

The carburetor on the engine is low emission. It is equipped with an idle speed adjustment screw, and an idle mixture valve that has an adjustment limiter which allows some adjustment (See Figure 18).

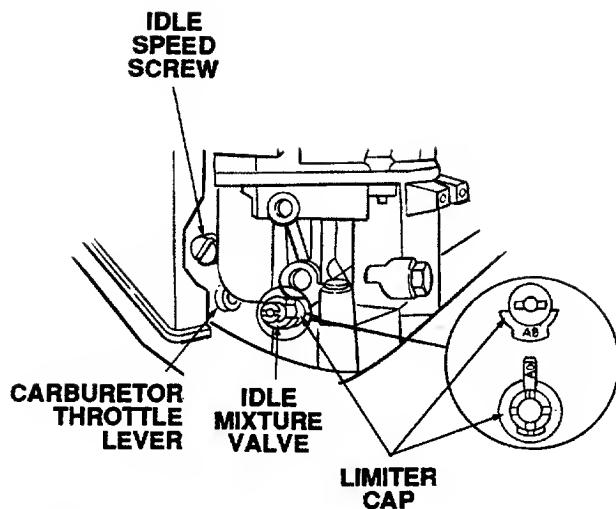


Figure 18

Start the engine and warm up approximately 5 minutes before adjusting. With the engine running, place the throttle control in the "SLOW" position. Rotate the carburetor throttle lever against the idle speed screw and hold it (See Figure 18). Turn the idle speed screw to obtain 1300 to 1500 RPM. While still holding the carburetor throttle lever against the idle speed screw, turn the idle mixture valve screw (with limiter cap) midway between limits.

Readjust the idle speed to 1200 RPM. Release the carburetor throttle lever. Move the throttle control to the "FAST" position. The engine should accelerate smoothly. If it does not, readjust the idle mixture valve slightly counterclockwise. DO NOT remove the limiter cap. DO NOT force beyond the limit.

NOTE

Engines operated at approximately 3000 to 5000 feet (900 to 1500 meters) above sea level may require a high altitude carburetor main jet. If erratic performance is observed, contact your Authorized Engine Dealer for a high altitude main jet.

Control Adjustments

To adjust the choke control, remove the air cleaner. Move the choke control to the full choke position. The carburetor choke should be completely closed (See Figure 19). If not, loosen the casing clamp screw.

Move the casing, wire and engine choke lever in the direction shown until the choke is completely closed. Tighten the casing clamp screw and replace the air cleaner.

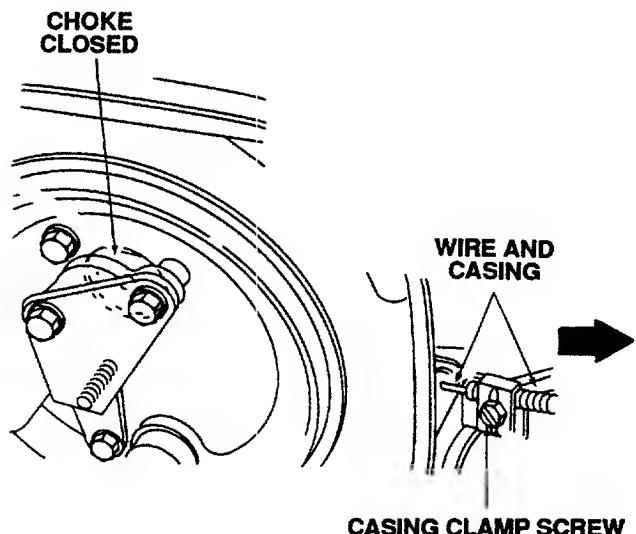


Figure 19

To adjust the throttle control, remove the air cleaner. Move the the throttle control to the "FAST" position. The swivel should be against the throttle stop (See Figure 20). If not, loosen the casing clamp screw. Move the casing and wire in the direction shown by the arrow until the swivel is against the throttle stop. Tighten the casing clamp screw and replace the air cleaner.

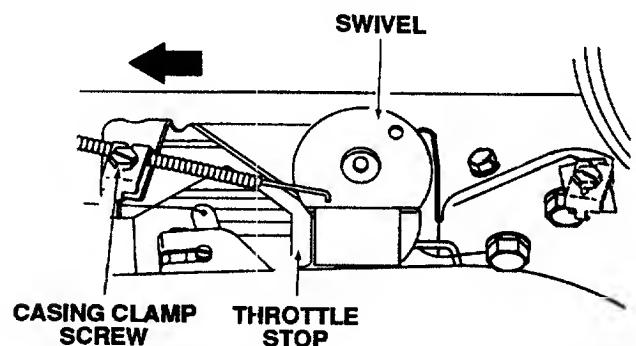


Figure 20

The adjustable governor control was set at the factory. If adjustment is required, consult your Authorized *Cub Cadet* Service Dealer.

SECTION IV. MAINTENANCE

ENGINE OIL

The engine-crankcase is filled with ship-away oil. This oil may be used for the first 5 hours of engine operation at temperatures between 0° and 90°F. If temperatures are not within this range, drain the oil from the oil filter and crankcase and replace with new oil as specified in the **LUBRICATION TABLE**. The engine oil must be drained and replaced with new oil after 5 hours of engine operation and then after every 50 hours of operation.

To aid starting, the selection of crankcase lubricating oils should be based on the lowest anticipated temperatures until the next scheduled oil change.

Cub Cadet Engine Oil meeting API Service Classification SG or SH is recommended. For maximum engine life select API SG or SH oils with lowest levels of barium, calcium or magnesium additives and minimum ash content (approximately 0.5%). Lubricant suppliers will normally furnish this information on their engine oils.

For oil change intervals of 100 hours, the following oils are recommended.

Ambient Temperature Viscosity (Grade SG/SH)

+40°F and Above — *Cub Cadet Engine Oil S.A.E. 30 weight*

0° to 40°F — *Cub Cadet Engine Oil S.A.E. 5W20 or S.A.E. 5W30**

0°F and below — *Synthetic Engine Oil S.A.E. 5W20 or S.A.E. 5W30 only*

*Synthetic Engine Oil S.A.E. 5W20 or S.A.E. 5W30 is acceptable.

Regularly check the oil level of the engine crankcase to see that it is filled to the correct level. Always keep the oil level between the "FULL" and the "LOW" marks on the dipstick. When checking the oil level, the engine must be cold, the dipstick must be withdrawn and wiped clean, then screwed all the way into the tube before being withdrawn for a true reading.

NOTE

Check the oil level only while the engine is stopped and the tractor is level.



CAUTION

The oil level should be checked every hour during the first 5 hours of operation.



NOTE

The engine oil level should be checked prior to every use.

CHECKING THE OIL LEVEL

Before each use, the oil level of the engine crankcase should be checked to see that it is filled to the correct level. Close monitoring of the oil level during the first 10 hours of operation of the engine is especially important. Before checking the oil level, clean the area around the oil level dipstick to prevent debris from entering the crankcase. Always keep the oil level between the "FULL" and the "LOW" marks on the dipstick (See Figure 19). When checking the oil level, the engine must be cold, the dipstick must be withdrawn and wiped clean, then screwed all the way into the tube before being withdrawn for a true reading.



NOTE

Check the oil level only while the engine is stopped and the tractor is level.

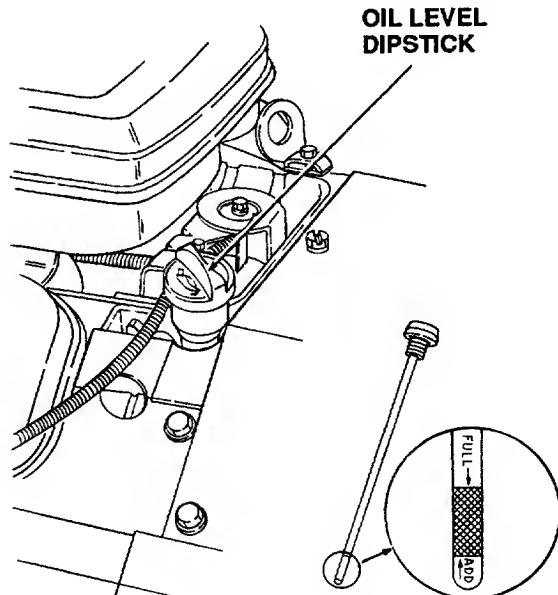


Figure 21



CAUTION

The oil level should be checked every hour during the first 5 hours of operation.



NOTE

The engine oil level should be checked prior to every use.

ADDING OIL



CAUTION

Never overfill the engine crankcase. The engine may overheat and/or damage may result if the crankcase is below the "LOW" mark or over the "FULL" mark on the dipstick.



NOTE

For best results, fill to the "FULL" mark on the dipstick as opposed to adding a given quantity of oil. Always check the level on the dipstick before adding more oil.

Refer to the **LUBRICATION TABLE** for information regarding the proper type of oil to add to the crankcase.

1. Place the tractor on a level surface and engage the brake pedal lock. Stop the tractor engine and remove the ignition key.
2. Clean the area around the oil filler cap to prevent debris from entering the crankcase.
3. Remove the oil filler cap from the left valve cover and SLOWLY pour in oil. Fill the crankcase until the oil level reaches the "FULL" mark on the dipstick (Refer to Figure 21).
4. Reinstall the oil filler cap by screwing it securely into the valve cover.



CAUTION

The oil filler cap **MUST BE TIGHTENED SECURELY INTO THE VALVE COVER AT ALL TIMES WHEN THE ENGINE IS OPERATING**. Severe engine damage could result from failure to do so.

DRAINING OIL AND REPLACING OIL FILTER



NOTE

The engine oil should be changed after the first 5 hours of operation. Then oil should be changed after every 50 hours of operation.



WARNING

If the tractor has recently been operated, the engine and surrounding areas may be hot. Use caution not to burn yourself when removing the side panels, draining the oil from the crankcase, and changing the oil filter.



NOTE

The oil filter should be changed at every oil change interval. The filters can be obtained through your *Cub Cadet* dealer under part number BS-492932.

Refer to the **MAINTENANCE CHART** and the **LUBRICATION TABLE** for information regarding the frequency of required oil changes and the quantity and type of oil needed.

The oil filter is located behind the left side panel and is mounted on the engine (See Figure 22).

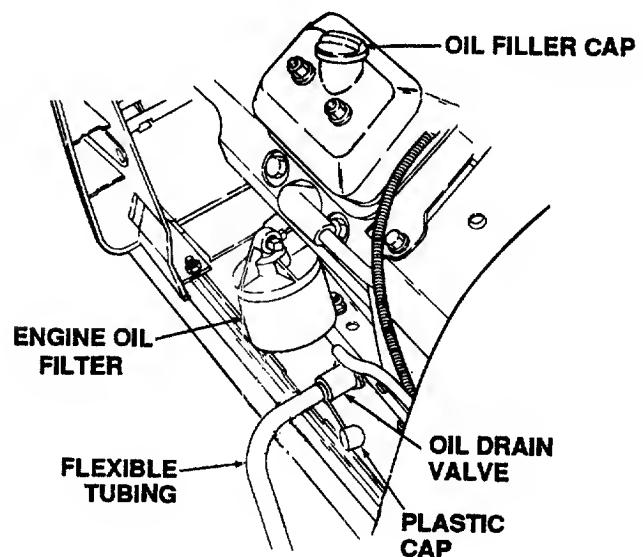


Figure 22

Run the engine for a few minutes to allow the oil in the crankcase to warm up. Warm oil will flow more freely and carry away more of the engine sediment which may have settled at the bottom of the crankcase. Use care to avoid burns from hot oil. While the engine oil is warm, proceed as follows:

NOTE

A 12 inch length of flexible tubing is supplied in the owner's manual package and should be used to drain the engine oil.

1. Place the tractor on a level surface and engage the brake pedal lock. Stop the tractor engine and remove the ignition key.
2. Clean around the base of the oil filter, the oil filler cap, and the dipstick tube to prevent debris from entering the crankcase.
3. Unseat the plastic dust cap from the engine oil drain valve. To prevent loss of the cap, do not remove the cap's retaining ring from the drain valve (Refer to Figure 22). Remove the dipstick.
4. Attach the flexible tubing (supplied in owner's manual package) to the drain valve. Place an appropriate container below the open end of the tubing to collect the old oil.
5. To open the drain valve, push it slightly inward and turn it counterclockwise until it stops, then pull it outward.
6. Remove the filter by turning it counterclockwise using an automotive type filter wrench to loosen.
7. Allow the old oil to completely drain from the engine crankcase into the container below. To close the drain valve, push it inward, turn clockwise until it stops and then release it.
8. Remove the flexible tubing from the drain valve. Clean the tubing and store in a safe place for future use.
9. Clean the drain valve and push the plastic dust cap onto the valve.
10. Apply a light coating of clean oil on the gasket of the new oil filter. Thread the filter on by hand until the gasket contacts the oil filter adapter, then tighten the filter an additional 1/2 to 3/4 turn.

Refer to **FILLING THE CRANKCASE** and to the **LUBRICATION TABLE** then refill the crankcase with the quantity and type of oil specified.

FILLING THE CRANKCASE

CAUTION

Never overfill the engine crankcase. The engine may overheat and/or damage may result if the crankcase is below the "LOW" mark or over the "FULL" mark on the dipstick.

NOTE

For best results, fill to the "FULL" mark on the dipstick as opposed to adding a given quantity of oil. Always check the level on the dipstick before adding more oil.

Refer to the **LUBRICATION TABLE** for information regarding the oil capacity and the proper type of oil to pour into the crankcase.

1. Place the tractor on a level surface and engage the brake pedal lock. Stop the tractor engine and remove the ignition key.
2. Clean the area around the oil filler cap and the dipstick to prevent debris from entering the crankcase.
3. Remove the oil filler cap from the valve cover and SLOWLY pour in oil. The oil capacity is approximately 3-1/2 pints. Fill the crankcase until the oil level reaches the "FULL" mark on the dipstick (Refer to Figure 21).
4. Reinstall the oil filler cap by screwing it securely into the valve cover.

CAUTION

The oil fill cap/dipstick MUST BE TIGHTENED SECURELY INTO THE VALVE COVER AT ALL TIMES WHEN THE ENGINE IS OPERATING. Severe engine damage could result from failure to do so.

5. Start the tractor engine and allow it to run for 30 seconds, then stop the engine and remove the ignition key.
6. Check the oil level and add oil if necessary. DO NOT OVERFILL THE ENGINE CRANKCASE.
7. Check the oil filter and drain valve for leaks.

CHECKING TRANSMISSION OIL LEVEL

→ NOTE

Check the oil level only while the engine is stopped and the tractor is level.

Check the oil level of the transmission case before each use to see that it is filled to the correct level. Before checking the transmission oil level, clean the area around the oil fill plug/dipstick to prevent debris from entering the transmission case. Always keep the oil level between the "FULL" and the "ADD" marks on the dipstick (See Figure 23). When checking the oil level, the dipstick must be withdrawn and wiped clean, then inserted all the way before being withdrawn for a true reading.

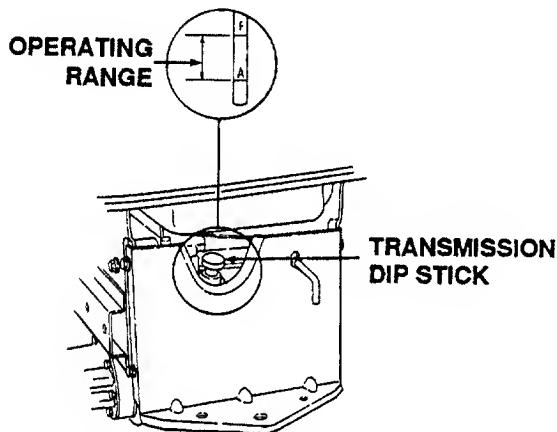


Figure 23

ADDING TRANSMISSION OIL



CAUTION

Never overflow the transmission case. Damage may result if the oil level in the transmission case is below the "ADD" mark or over the "FULL" mark of the dipstick.

→ NOTE

For best results, fill to the "FULL" mark on the dipstick as opposed to adding a given quantity of oil. Always check the level on the dipstick before adding more oil.

Refer to the **LUBRICATION TABLE** for information regarding the proper type of oil to add to the transmission case.

1. Place the tractor on a level surface and engage the brake pedal lock. Stop the tractor engine and remove the ignition key.
2. Clean the area around the oil fill plug/dipstick to prevent debris from entering the transmission case.
3. Remove the oil fill plug/dipstick from the oil fill port and SLOWLY pour oil into the oil fill port. Fill the transmission case until the oil level reaches the "FULL" mark on the dipstick (Refer to Figure 23).
4. Reinstall the oil fill plug/dipstick securely into the oil fill port.



CAUTION

The oil fill plug/dipstick MUST BE INSTALLED SECURELY INTO THE FILL PORT AT ALL TIMES WHEN THE ENGINE IS OPERATING.

HYDROSTATIC DRIVE OIL FILTER (MODEL 2165)



CAUTION

Never overfill the transmission case. Damage may result if the oil level in the transmission case is below the "ADD" mark or over the "FULL" mark of the dipstick.

→ NOTE

For best results, fill to the "FULL" mark on the dipstick as opposed to adding a given quantity of oil. Always check the level on the dipstick before adding more oil.

1. Refer to the **MAINTENANCE CHART** for information regarding the frequency of the hydrostatic transmission oil filter replacement. The filter can be obtained through your *Cub Cadet* dealer under the part number 723-3014.

Refer to the **LUBRICATION TABLE** for information regarding the oil capacity and the proper type of oil to pour into the transmission case.

1. Place the tractor on a level surface and engage the brake pedal lock. Stop the tractor engine and remove the ignition key.
2. Clean the area around the transmission drain plug to prevent debris from entering the transmission case. Remove the drain plug and allow the transmission oil to drain into a clean container having a capacity of more than 7 quarts. Reinstall the drain plug (Refer to Figure 24).

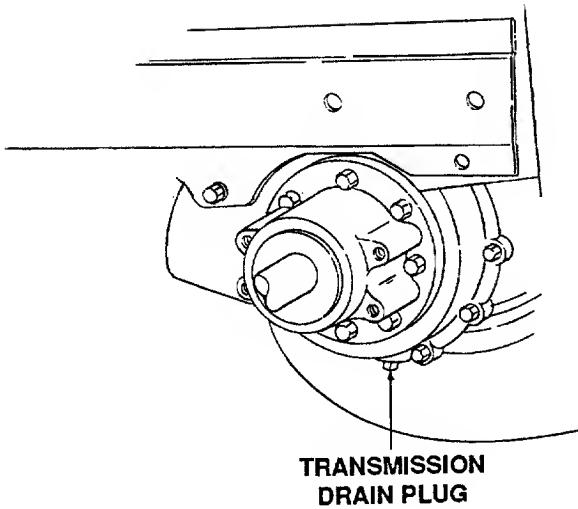


Figure 24



CAUTION

If the transmission oil is to be re-used, cover the container holding the drained oil to prevent contamination. Contaminated transmission oil can damage the hydro transmission.

- Clean around the base of the transmission oil filter and remove the filter by turning it counterclockwise (Refer to Figure 25).

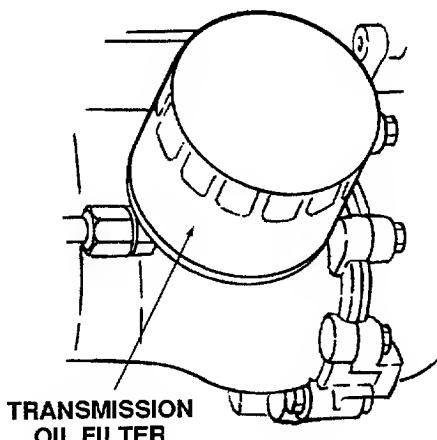


Figure 25

- Apply a light coating of clean transmission oil to the gasket of the new filter. Install the filter by turning it clockwise, by hand, until the gasket contacts the filter base on the transmission housing; then tighten the filter an additional 1/2 turn.

- Clean the area around the transmission oil fill plug/dipstick to prevent debris from entering the transmission case.
- Remove the oil fill plug/dipstick from the oil fill port and SLOWLY pour oil into the oil fill port. Fill the transmission case until the oil level reaches the "FULL" mark on the dipstick (Refer to Figure 23).
- Reinstall the oil fill plug/dipstick securely into the oil fill port.
- Start the engine and allow it to run for a few minutes. Shut the engine off, then check for leaks and re-check the oil level in the transmission case.



CAUTION

The oil fill plug/dipstick MUST BE INSTALLED SECURELY INTO THE FILL PORT AT ALL TIMES WHEN THE ENGINE IS OPERATING.

AIR CLEANER

Check the air cleaner daily or before starting the engine. Check for loose or damaged components and check the condition of the filter element. Remove any buildup of dirt and debris in the air cleaner housing.



NOTE

Operating the engine with loose or damaged air cleaner components will allow unfiltered air into the carburetor, causing extensive wear and eventual failure of the engine.

Servicing the Precleaner

Wash and re-oil the foam precleaner at 1 month intervals or after every 10 hours of operation (more often under extremely dusty or dirty conditions), whichever occurs first.

- Unhook the clips on both sides of the air cleaner cover and remove the air cleaner cover (See Figure 26).
- Remove the foam precleaner by sliding it up off the paper element (See Figure 26).
- Wash the precleaner in warm water with detergent. Rinse the precleaner thoroughly until all traces of the detergent are eliminated. Squeeze out (do not wring) excess water in a dry cloth. Allow the precleaner to air dry.
- Saturate the foam precleaner with new engine oil. Squeeze out all excess oil in a dry cloth.

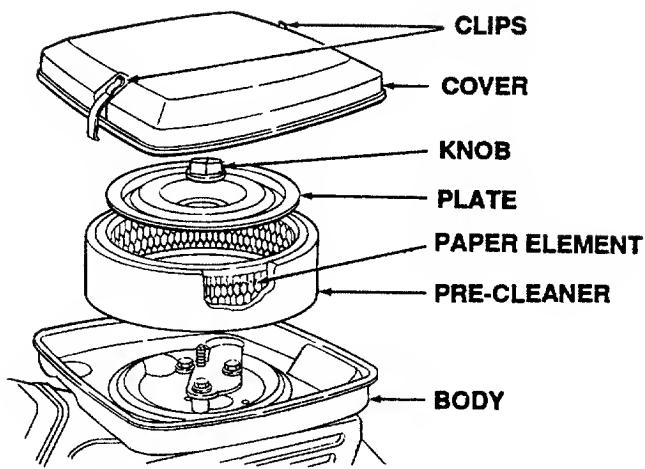


Figure 26. Air Cleaner Assembly.

5. Reinstall the foam precleaner over the paper element.
6. Reinstall the air cleaner cover and reattach the cover clips to both sides of the air cleaner body.

Servicing the Paper Element

Every 100 hours of operation (more often under extremely dusty or dirty conditions), inspect the paper element. Replace the element as necessary.

1. Unhook the clips on both sides of the air cleaner cover and remove the air cleaner cover (See Figure 26).
2. Remove the foam precleaner by sliding it up off the paper element (See Figure 26).
3. Remove the knob and element cover plate, then lift out the paper air filter element.
4. Do not wash the paper element or use pressurized air, as this will damage the element. Replace a dirty, bent or damaged element. Handle new elements carefully; do not use if the sealing surfaces are bent or damaged.
5. When servicing the air cleaner, check the air cleaner body. Make sure it is secured and not bent or damaged. Also check the element cover plate for damage or improper fit. Replace all damaged air cleaner components.
6. Reinstall the paper element, foam precleaner, cover plate and knob. Reinstall the air cleaner cover and reattach the cover clips to both sides of the air cleaner body.

Properly cleaned and installed air cleaner elements significantly contribute to prolonging engine life.

CLEANING ENGINE

This tractor has an air-cooled engine. Air must be able to circulate freely around the engine through the flywheel screen, through the cooling shrouds and over the fins of the cylinder head and cylinder block (See Figure 27). Keep these areas free of accumulated dirt and debris or the engine will overheat; possibly causing extensive engine damage. Regularly clean the inside of the side panels, dash intake screen and grille to ensure adequate cooling. If debris has accumulated inside the cooling shrouds, the blower housing and cooling shrouds should be removed and the cooling fins cleaned.

NOTE

This machine is designed to cool properly with the side panels in place. Operating without the panels could cause premature accumulation of dirt and debris on the engine, resulting in inadequate cooling.

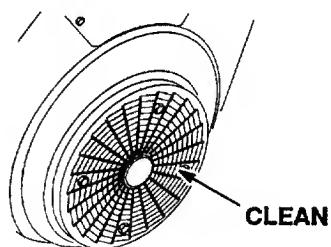
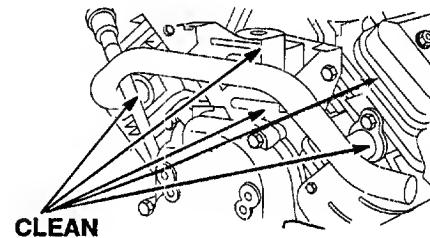


Figure 27

To assure smooth operation, keep the governor linkage, springs and controls free of debris (See Figure 28).

CAUTION

Keep the muffler area clean. Before running the engine, clean the muffler area to remove all combustible debris. Inspect the muffler area often when mowing during the Fall season.

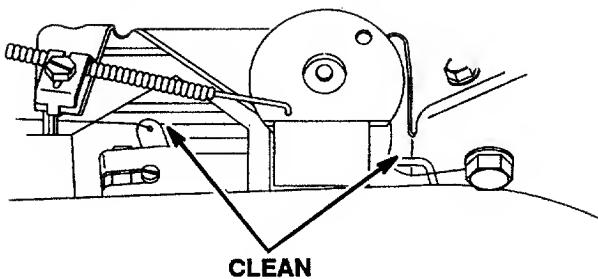


Figure 28

SPARK PLUG



WARNING

To avoid possible injury, be sure the engine is off and has cooled before making any adjustments or repairs.



NOTE

Remove all dirt from around the spark plug before removing.

To remove the spark plugs, always use a spark plug wrench. Check the gap after every 100 hours of operation.

Replace a defective plug with a new plug. Set the spark plug gap at .030 inch (See Figure 29). Tighten the plug to 10-15 ft-lbs. See your authorized dealer for the correct replacement plug.

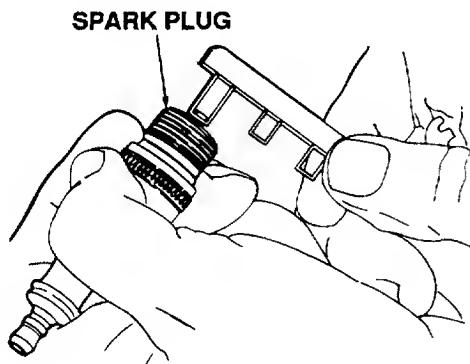


Figure 29

FUEL FILTER



WARNING

Do not replace the fuel filter when engine is hot.

The engine is equipped with an inline fuel filter. Visually inspect the filter periodically for a build-up of residue inside the filter body, and for a dirty element which can be indicated by discoloration. Replace the fuel filter when dirty.

HEADLIGHTS

Refer to **SPECIFICATIONS** when replacement of head lamp bulbs is necessary.



WARNING

Allow the engine and surrounding surfaces to cool before changing the head lamp bulbs.



CAUTION

Do not touch the glass portion of the head lamp bulb. Touching the glass portion will reduce the life of the bulb.

Referring to Figure 30, replace the head lamp bulb as follows:

1. Rotate the bulb assembly 1/4 turn counterclockwise to remove from the reflector housing
2. Spread the locking clips of the harness socket and pull the bulb assembly from the socket.
3. Without touching the glass surface, plug the new bulb assembly into the harness socket, making sure the harness clips lock onto the tabs on the sides of the bulb assembly.
4. Align the tabs on the face of the bulb assembly with the notches in the reflector housing, then push the bulb assembly into the housing and rotate 1/4 turn clockwise to lock in place.

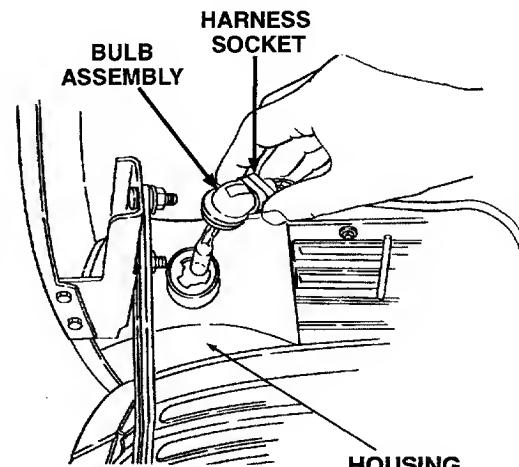


Figure 30

FUSES

Always use the same capacity fuse for replacement. Refer to **SPECIFICATIONS**. If the electrical system does not function, check the fuses.

To replace a fuse, pull the old fuse from the fuse holder and install the new fuse.

BATTERY INFORMATION



WARNING

- A. Battery acid must be handled with great care, as contact with it can burn and blister the skin. It is advisable to wear protective clothing (goggles, rubber gloves and apron) when working with acid.
- B. Should battery acid accidentally splatter into the eyes or onto the skin, rinse the affected area immediately with clean cold water. If there is any further discomfort, seek prompt medical attention.
- C. If acid spills on clothing, first dilute it with clean water, then neutralize with a solution of ammonia/water or baking soda/water.
- D. Since battery acid is corrosive, do not pour it into any sink or drain. Before discarding an empty electrolyte container, rinse it thoroughly with a neutralizing solution.
- E. NEVER connect (or disconnect) battery charger clips to the battery while the charger is turned on, as it can cause sparks.
- F. Keep all sources of ignition (cigarettes, matches, lighters) away from the battery. The hydrogen gas generated during charging can be combustible.
- G. As a further precaution, only charge the battery in a well ventilated area.

Always shield eyes and protect skin and clothing when working near batteries.



DANGER

BATTERIES CONTAIN SULFURIC ACID AND MAY EMIT EXPLOSIVE GASES. USE EXTREME CAUTION WHEN HANDLING BATTERIES.

KEEP BATTERIES OUT OF THE REACH OF CHILDREN.

MAINTENANCE OF BATTERY

1. Check the electrolyte level periodically (at least every two weeks). Keep the level to the split rings. Use only distilled water or a good quality drinking water. Never add acid or any other chemicals to the battery after initial activation.
2. The battery should be checked with a hydrometer after every 25 hours of operation. If the specific gravity of any cell is less than 1.235, the battery should be recharged. Maximum charge rate is 5 amps.
3. Spray the terminals and exposed wire with a battery terminal sealer, or coat the terminals with a thin coat of grease or petroleum jelly, to protect against corrosion.
4. The battery should be kept clean. Any deposits of acid should be neutralized with baking soda and water. Be careful not to get this solution in the cells.
5. Avoid tipping the battery. Even a "sealed" battery will leak electrolyte when tipped.

STORAGE OF THE BATTERY

1. When storing the tractor for extended periods, disconnect the battery cables. Removing the battery from the unit is recommended.
2. All batteries discharge during storage. Keep the exterior of the battery clean, especially the top. A dirty battery will discharge itself more rapidly.
3. Check the battery with a hydrometer. The battery must be stored with a full charge. A discharged battery will freeze at a higher temperature.

Specific Gravity

1.265

-71°F

1.250

-62°F

1.200

-16°F

1.150

5°F

1.100

16°F

4. Recharge the battery whenever the specific gravity is less than 1.235; before returning to service; or every two months, whichever comes first.

COMMON CAUSES FOR BATTERY FAILURE

1. Overcharging
2. Undercharging
3. Lack of water
4. Loose and/or corroded connections
5. Excessive loads
6. Battery electrolyte substitutes
7. Freezing of electrolyte

*** These causes do not constitute warranty in the event of a battery failure.**

BATTERY REMOVAL OR INSTALLATION



WARNING

When removing the battery, disconnect the battery cables in the following order to avoid arcing and the resulting sparks:

Battery Removal:

1. Disconnect the Negative cable.
2. Disconnect the Positive cable.

Battery Installation:

1. Connect the Positive cable.
2. Connect the Negative cable.

To replace the battery, proceed as follows:

1. Remove the negative cable from the negative terminal of the battery, then remove the positive cable from the positive terminal.
2. Remove the wing nut securing the mounting rod to the bulkhead mounting bracket (Refer to Figure 31) and pull the rod downward from the bulkhead bracket.

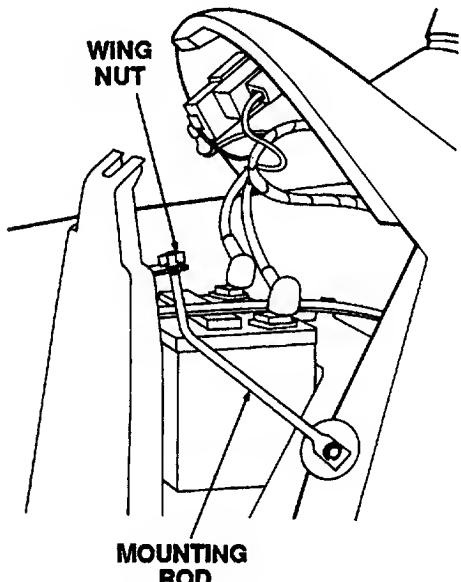


Figure 31

3. Rotate the mounting rod fully upward toward the dash panel to provide clearance for battery removal (See Figure 32).
4. Pull downward on the bottom of the battery holdown strap to release it from the tab beneath the battery tray.
5. Loosen the hose clamp and pull the drain tube from the battery.

6. Lift the battery upward and remove from the left side of the tractor.

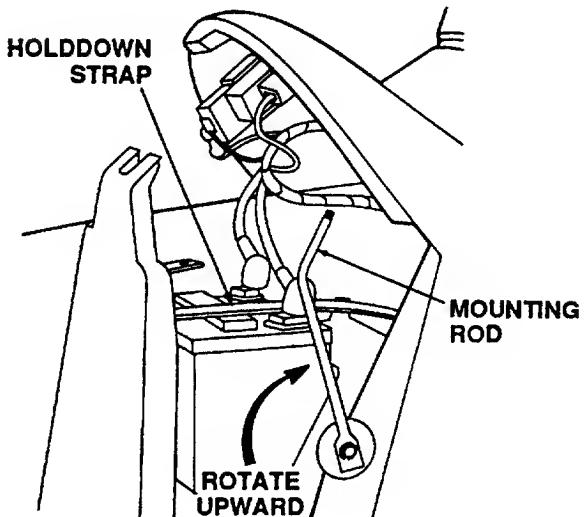


Figure 32

7. Install the new battery from the left side of the tractor and lower into the battery tray.
8. Install the drain tube onto the battery and secure with the hose clamp.
9. Stretch the battery holdown strap downward across the front of the battery and hook to the tab below the battery tray.
10. Rotate the mounting rod downward and insert through the bottom of the hole in the bulkhead mounting bracket (See Figure 31).
11. Install the wing nut onto the mounting rod, but do not tighten until after the side panels are installed.
12. Connect the positive cable to the positive terminal of the battery, then connect the negative cable to the negative terminal.

JUMP STARTING



WARNING

Failure to use this jump starting procedure could cause sparking, which could result in an explosion of either battery.

1. Attach the first jumper cable from the positive terminal of the good battery to the positive terminal of the dead battery.
2. Attach the second jumper cable from the negative terminal of the good battery to the FRAME OF THE UNIT WITH THE DEAD BATTERY.

TIRES

Keep the pneumatic tires properly inflated. Over-inflation will cause operator discomfort. Under-inflation will cause short tire life.

Improperly inflated tires will also affect the leveling of the mower deck and quality of cut.

Inflate the front and rear tires as shown in the following table:

Tire Size	Pounds per Square Inch
Front Tires 16 x 6.5-8	14
Rear Tires 23 x 9.5-12	10

Always ensure that the tire valve caps are in place and tightened securely to prevent loss of air and to protect the valve core and stem.

Do not overload the tractor tires by mounting equipment on the tractor which exceeds the load capacity of the size of the tires on the tractor.

MOUNTING TIRES ON THE RIM



WARNING

Do not mount a tire unless you have the proper equipment. Do not inflate the tire above the recommended pressure. Do not stand over the tire assembly when inflating. Accidental over inflation could cause an explosive separation of the tire and rim, which could result in serious injury or death.

After mounting a new or old tire on the rim, inflate it to 20 pounds (maximum) pressure to seat the tire bead on the rim flange. Then deflate the tire to the correct operating pressure.



NOTE

After the first 10 hours of operation, check and retorque the rear wheel lug nuts (both sides) to 35 ft-lbs to make sure they are seated in the rim and are properly tightened.

SECTION V. OFF-SEASON STORAGE

If the machine is to be inoperative for a period longer than 30 days, the following procedures are recommended:



WARNING

Never store the tractor with fuel in the tank indoors or in poorly ventilated enclosures, where fuel fumes may reach an open flame, spark or pilot light as on a furnace, water heater, clothes dryer, etc.



CAUTION

Fuel left in the fuel tank during warm weather deteriorates and will cause serious starting problems.

1. To prevent gum deposits from forming inside the engine's carburetor and causing possible malfunction of the engine, remove all gasoline from the fuel tank as follows:



WARNING

Do not drain fuel when the engine is hot. Allow the engine adequate time to cool.

Drain fuel into an approved container outdoors, away from open flame.

- a. Drain any large volume of fuel from the tank by disconnecting the fuel line from the in-line fuel filter near the engine.
- b. Reconnect the fuel line and run the engine until it starts to falter, then use the choke to keep the engine running until all fuel in the carburetor has been exhausted.
- c. Again disconnect the fuel line and drain any remaining gasoline from the system.

2. Remove the spark plugs and pour one (1) ounce of engine oil through the spark plug holes into the cylinders. Crank the engine several times to distribute the oil. Replace the spark plugs.
3. Clean the engine and the entire tractor thoroughly.
4. Lubricate all lubrication points.
5. Follow the battery storage instructions on page 33.
6. Protect the tires and seat from sunlight. Regularly check the tires to maintain proper inflation.

SECTION VI. MOWING

MOWING



WARNING

To avoid possible injury, do not allow anyone in the area opposite the discharge chute while mowing. Although the area has been supposedly cleared of foreign objects, small objects may be picked up and discharged by the mower.



WARNING

Never direct the discharge of material toward bystanders or allow anyone near the machine while in operation.

For best results it is recommended that the first two laps should be cut with the discharge thrown towards the center. After the first two laps, reverse the direction to throw the discharge to the outside for the balance of cutting. This will give a better appearance to the lawn.

Do not cut the grass too short, as the mower will tend to scalp the grass. Short grass invites weed growth and yellows quickly in dry weather.

Mowing should be done with the engine at full throttle. Do not mow at high ground speed.

During certain times of the year and under some conditions, the mower may leave streaks of uncut grass.

Streaking may occur when attempting to mow heavy weeds and tall grass. Under these conditions it may be necessary to go back over the cut area a second time to get a clean cut.

The following practices will help eliminate streaking:

1. Mow the area more often so the grass doesn't get too tall and heavy.
2. Operate the tractor at full throttle and slower forward speeds.
3. Keep the blades sharp and replace the blades when worn.
4. Follow the mowing pattern shown in Figure 33.

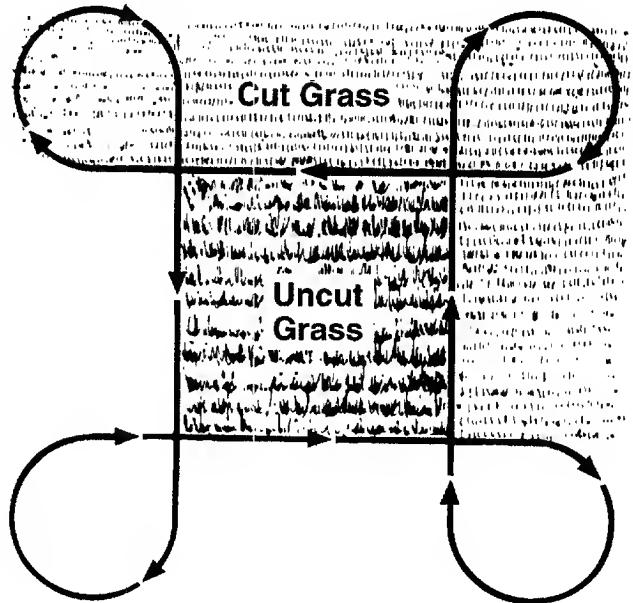


Figure 33

OPTIONAL EQUIPMENT AND ACCESSORIES

When you purchased your tractor, you probably had it completely equipped for your particular needs at the time. However, later you may wish to obtain optional equipment or accessories. These items and other allied equipment can be purchased from, and installed by, your authorized *Cub Cadet* dealer.

The tractor is used for so many different types of work, and because it is called on to operate under so many different conditions, a variety of equipment is available to adapt it to the requirements of the user. **Refer to the attachment guide for a complete description of equipment and required components that can be utilized with your tractor.**

MAINTENANCE CHART

Operation to be performed	Before each use	10 hours or once a month	30 hours or three times a season	50 hours or twice a season	100 hours or yearly	Before storage
Clean grille, engine air inlet screen, dash intake screen and side panel screens		More often under dirty conditions X				
Check engine oil level	X					
Fill fuel tank	X					
Change engine oil & oil filter	After first 5 hours			More often under dirty conditions X	X	
Check transmission oil level	X					
Replace transmission oil filter (Model 2165 only)		After first 10 hours X		After first 50 hours X	Every 100 hours thereafter X	
Clean & re-oil foam air precleaner		X				
Check battery electrolyte level		X				
Grease front axle pivot bolt		X				
Grease steering knuckles		X				
Retorque rear wheel lug nuts		After first 10 hours X				
Clean cooling fins & external surfaces			X			
Service air cleaner paper cartridge					More often under dirty	
Check spark plugs					X	X
Grease steering gear housing			X			
Grease front wheel bearings			X			X
Drain fuel						X
Pivot bar adjustment bolts				X		
Lubricate all foot and lift control pivot points		X				



Maintenance information for optional equipment may be found in the manual which is included with that specific piece of equipment.

TROUBLE SHOOTING

Possible Cause	Possible Remedy
HARD TO START	
No gasoline in fuel tank or carburetor	Fill the tank with gasoline. Check the fuel line, carburetor and fuel filter.
Fuel line or carburetor clogged.....	Clean the fuel line and carburetor with a commercial carburetor cleaner.
Fuel filter plugged.....	Replace.
Water in gasoline.....	Drain the fuel tank and carburetor. Use new fuel and dry the spark plugs.
Choked improperly. Flooded engine	Follow the starting instructions.
Defective ignition or loose wiring.....	Check the wiring, spark plugs or fuse.
Defective battery	Check and service. Refer to " BATTERY. "
Spark plug dirty or improper gap.....	Clean, adjust the gap to .030-inch or replace the plug.
ENGINE OPERATES IRREGULARLY OR KNOCKS	
Engine incorrectly timed.....	*
Spark plug dirty; wrong gap or wrong type.....	Clean, reset the gap or replace.
Poor or weak spark	Check the spark plugs and wiring.
Carburetor setting incorrect.....	Adjust. Refer to " ADJUSTMENTS. "
Poor grade fuel or water in fuel	Drain and use a good grade of clean fuel.
Engine overheating	Refer to " MAINTENANCE. "
Engine valves at fault	*
Engine smokes.....	Adjust the carburetor.*
Oil level rises due to gasoline in crankcase	*
Air filter becomes oil and fuel soaked.....	*
Engine leaks oil	*
Misfiring	*
Other engine problems.....	*
Excessive oil in air cleaner.....	Be sure that oil dipstick is fully seated and all excess oil is squeezed out of the pre-cleaner foam element.
PTO CLUTCH WILL NOT ENGAGE	
Low or zero voltage	Check battery. Charge or replace. Check charging system. Check for worn or broken wiring or connections. Check clutch coil resistance. Check switch.
Rotor/armature air gap too large	Rotor/armature worn. Replace PTO clutch.

* See your authorized dealer.

TROUBLE SHOOTING

Possible Cause	Possible Remedy
LACK OF POWER	
Air cleaner clogged	Service the air cleaner element. Refer to " MAINTENANCE. "
Engine overload.....	Reduce the load.
Engine overheated.....	Make sure the air intake screen, shrouding, engine fins, side panels, dash intake screen and grille are free of accumulated dirt and debris. Refer to " MAINTENANCE. "
Fuel tank air vent clogged.....	Remove obstruction from the vent in the fuel tank cap.
Air leakage between carburetor and engine	Remove air cleaner. Tighten the carburetor and manifold mounting nuts. Replace any damaged parts as indicated in " MAINTENANCE. "
Incorrect timing or faulty ignition.....	*
Brake dragging	Adjust the brake. Refer to " ADJUSTMENTS. "
Insufficient cooling air — dirt or debris clogging the: air intake screen • shrouds • cooling fins • side panels • dash intake screen • or grille.....	Keep the air intake area, side panels, grille, dash intake screen and cooling fins clean; refer to " MAINTENANCE. "
Oil level incorrect	Engine oil level must not be over the "FULL" mark or below the "LOW" mark on dipstick. Refer to " MAINTENANCE. "

* See your authorized dealer.

LUBRICATION TABLE

Point of Lubrication	Check at Hours	Change at Hours	Capacity	Anticipated Air Temperature		
				Above +40°F	0° to 40°F	Below 0°F
Engine crank-case	Check before each use	50	Approx. 3 pints 8 ounces	<i>Cub Cadet</i> Engine Oil SAE 30	<i>Cub Cadet</i> Engine Oil SAE5W30 or 10W30	Synthetic Engine Oil SAE 5W20 or 5W30
Six speed transaxle (2160) or Hydro drive unit and transmission case with filter (2165)	Check before each use	Add as needed	Approx. 6.8 qts Approx. 7 qts	<i>Cub Cadet</i> Drive System Oil NOTE: <i>Cub Cadet</i> Drive System Oil is specially formulated for this application. If any other oil is used <i>Cub Cadet</i> will not be responsible for substandard performance. Failures due to use of improper fluid are not covered by warranty. For maximum protection, use <i>Cub Cadet</i> Drive System Oil.		
Drive clutch-six speed (2160)	†	†	Approx. 21 fl.oz.	† <i>Cub Cadet</i> Hydraulic Transmission Fluid		
Steering knuckles and front axle pivot bolt	10			Use 251H EP grease or equivalent No. 2 multi-purpose lithium grease and apply two strokes (minimum) or sufficient grease to flush out old grease and dirt.		
Front wheel bearings	30			Two strokes (minimum) of the lubricator using 251H EP grease or equivalent No. 2 multi-purpose lithium grease.		
Steering gear housing	30			Two strokes (minimum) of the lubricator using 251H EP grease or equivalent No. 2 multi-purpose lithium grease.		
Foot and lift control pivot points	10			Use a liberal amount of high grade lubricating oil.		

† The drive clutch is a sealed unit which requires no regular maintenance. Contact your *Cub Cadet* dealer if service is required.

LUBRICATION GUIDE



WARNING

The service life and reliability of any machine depends upon the care it is given. Proper lubrication is a very important part of that care. This lubrication schedule reflects the minimal requirements to maintain the equipment. More frequent inspections and maintenance is preferable.

Using the lubrication illustration as a guide, make certain that all lubrication fittings are installed and functioning.

Be sure all fittings are free from dirt and paint so the lubricant is certain to enter the bearing.

Using a pressure lubricating gun, always force the lubricant through the full length of each bearing until it emerges at the end, carrying with it the worn lubricant and any dirt that may have entered the bearing.

Miscellaneous working parts not provided with lubrication fittings should be oiled regularly with a good grade of lubricating oil.

Always lubricate the tractor thoroughly before taking it to a remote location for a prolonged period of time.

Lubricant is cheap. Use plenty of it. Worn parts can be expensive to replace.

Keep your supply of lubricating oil and grease stored in clean containers, and covered to protect from dust and dirt.

Keep the lubricating gun nozzle clean and wipe dirt from the grease fittings before lubricating.

The symbols in the illustrations indicate the method of application and the hourly intervals to apply the lubricant.



Use a pressure lubricating gun and apply 251H EP grease (or equivalent No. 2 multi-purpose lithium grease) sufficient to flush out the old grease and dirt. Lubricate at the hourly intervals indicated on the symbols.



Dipstick, use to check engine and transmission oil before each use.

LUBRICATION GUIDE

—Before Each Use

1. Engine filler cap and dipstick
2. Transmission oil level and fill port

Check the oil (with the engine stopped) and add sufficient new oil to bring it to the “**FULL**” mark on the dipstick. Do not overfill. Do not operate the engine if the oil level is below the “**LOW**” mark on the dipstick.

Check the oil with the engine stopped. Keep the lubricant up to the “**FULL**” mark on the dipstick.

NOTE: The transmission oil level and fill port services the following:

1. Rear axle (Models 2160 and 2165)
2. Hydrostatic transmission (Model 2165 only)

—After Every 10 Hours of Operation

3. Steering knuckles (2) (both sides)
4. Transmission oil filter (Model 2165 only)
5. Front axle pivot bolt
6. Foot and lift control pivot points

Use 251H EP grease or an equivalent No. 2 multi-purpose lithium grease and apply sufficient grease to flush out old grease and dirt.

NOTE: After the first 10 hours only, remove the transmission oil filter and replace with a new filter. Refer to “**MAINTENANCE**.” Change the transmission oil filter after 50 hours and every 100 hours of operation thereafter.

Use 251H EP grease or an equivalent No. 2 multi-purpose lithium grease and apply sufficient grease to flush out old grease and dirt.

Use a liberal amount of high grade lubricating oil.

—After Every 30 Hours of Operation

7. Front wheel bearings
8. Steering gear housing (2)
9. Transmission oil filter (Model 2165 only)
10. Engine oil drain valve and oil filter

Two or three strokes minimum of the lubricator using 251H EP grease or an equivalent No. 2 multi-purpose lithium grease.

Every 30 hours or three times a season, use 251H EP grease or an equivalent No. 2 multi-purpose lithium grease. Apply two strokes with lubricator.

—After Every 50 Hours of Operation

11. Transmission oil filter (Model 2165 only)

NOTE: After the first 50 hours only, remove the transmission oil filter and replace with a new filter. Refer to “**MAINTENANCE**.” Change the transmission oil filter every 100 hours of operation thereafter.

While the engine oil is warm, open the drain valve and remove the oil filter, and drain all of the oil from the crankcase. Close the drain valve. Refer to “**MAINTENANCE**,” “**FILLING THE CRANKCASE**” and “**OIL FILTER**” for proper oil filling procedure. Refer to “**LUBRICATION TABLE**” for the proper quantity and viscosity to use.

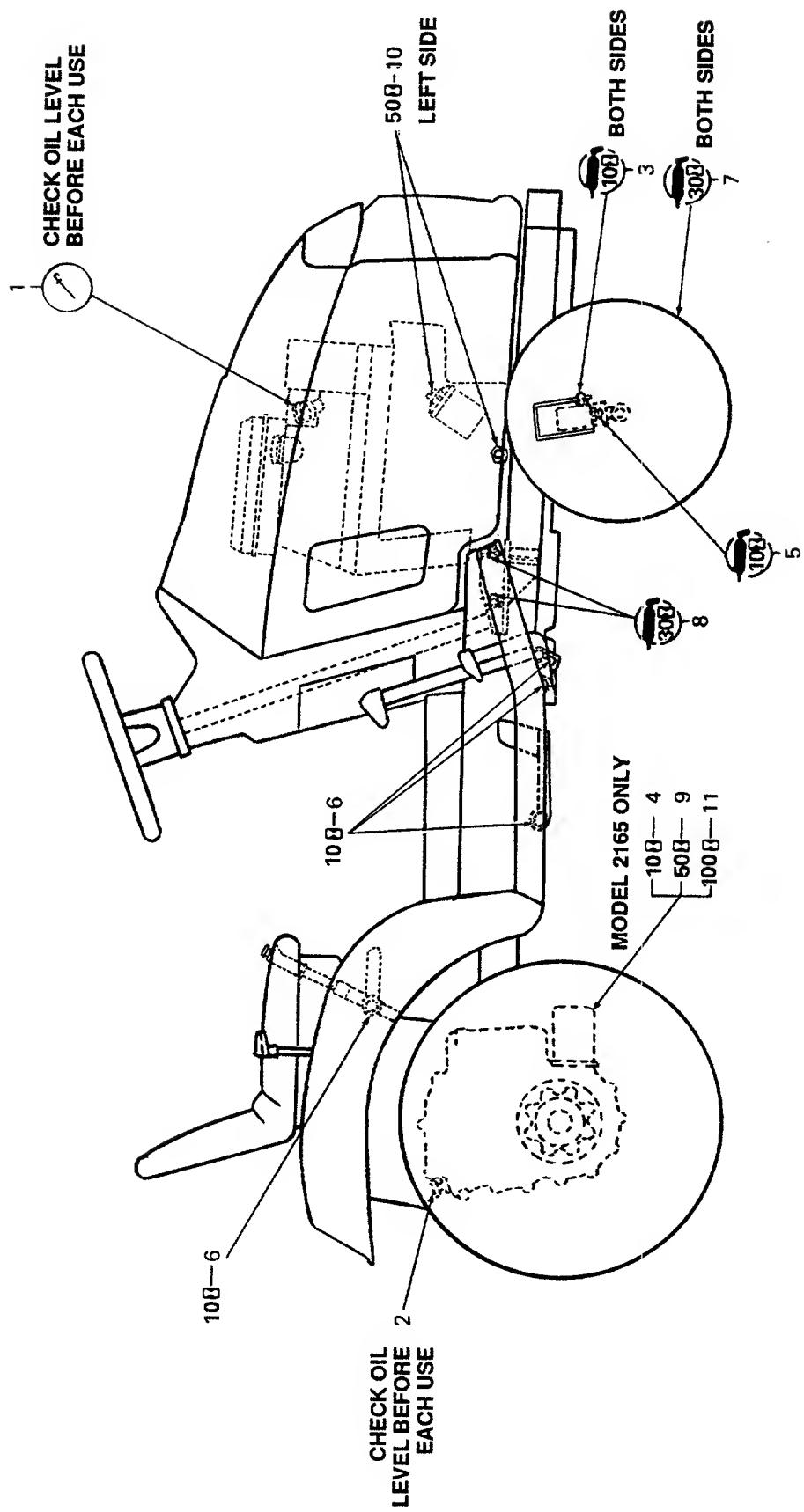
—After Every 100 Hours of Operation

Change the transmission oil filter and replace with a new filter. Refer to “**MAINTENANCE**.”



Lubrication information for optional equipment may be found in the manual which is included with the specific piece of optional equipment.

LUBRICATION GUIDE



SPECIFICATIONS

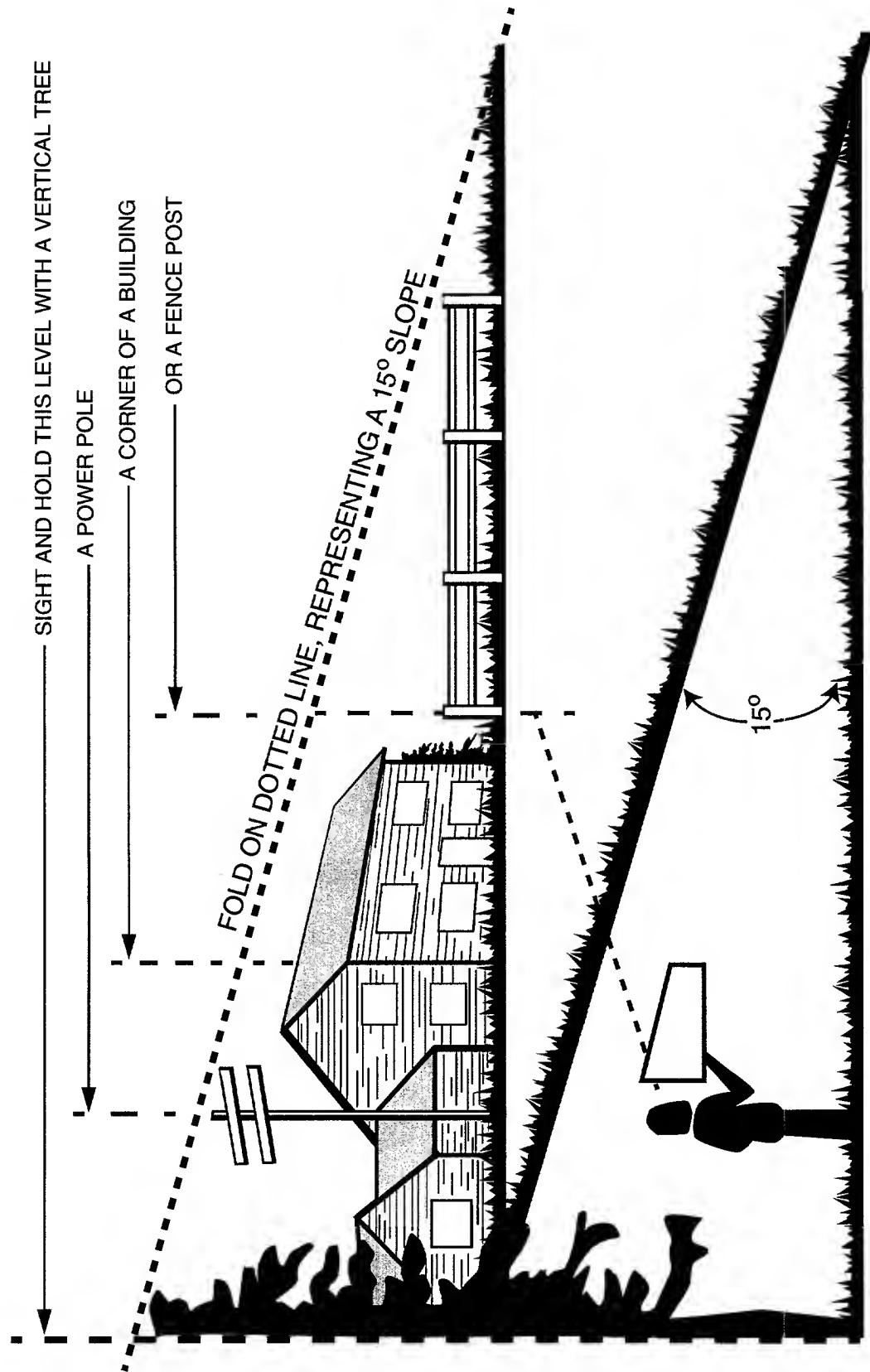
	2160	2165
CAPACITIES		
Fuel Tank	3 gallons	
Crankcase (approximately)	3 pints 8oz.	
Transmission Case (approximately)	6 qts.	
SIX SPEED DRIVE		
Speed: Forward	0 to 5.5 mph	
Reverse	0 to 3 mph	
HYDROSTATIC DRIVE		
Speed: Forward	0 to 6 mph	
Reverse	0 to 3 mph	
ENGINE		
Make and Model	Vanguard	
Horsepower	16 HP	
Cylinders	2	
Bore	2.68 in.	
Stroke	2.60 in.	
Displacement (cubic inches)	29.3	
Engine Speed (governed)		
Low Speed.....	1200 RPM	
High Speed (no load)	3600 RPM	
(full load)	3350 RPM	
Valve clearance (engine cold)		
Intake004-.006 in.	
Exhaust.....	.004-.006 in.	
Ignition	Battery	
Spark Plug Gap (Cub Cadet No. 759-3336)030 in.	
ELECTRICAL SYSTEM		
System Voltage	12 volt neg. ground	
Battery	725-1707B	
Alternator	15 amp regulated	
Fuse (auto type)	20 amp	
Head Lamp Bulb	759-3693	
BRAKES	Internal expanding	
TIRE SIZES		
Front	16 x 6.5-8	
Rear	23 x 9.5-12	
DIMENSIONS		
Tread:		
Front with 16 x 6.5-8 tires	31.50 in.	
Rear with 23 x 9.5-12 tires	30.25 in.	
Wheelbase	47.00 in.	
Length, over all	72.00 in.	
Width, over all	39.00 in.	
Height, over all (to top of steering wheel)	42.00 in.	
Ground Clearance	6.00 in.	
Turning Radius	28.00 in.	

Specifications are subject to change without notice.

SLOPE GAUGE

(Keep this sheet in a safe place for future reference.)

USE THIS PAGE AS A GUIDE TO DETERMINE SLOPES WHERE YOU MAY NOT OPERATE SAFELY.



WARNING

Do not mow on inclines with a slope in excess of 15 degrees (a rise of approximately 2-1/2 feet every 10 feet). A riding mower could overturn and cause serious injury. If operating a walk-behind mower on such a slope, it is extremely difficult to maintain your footing and you could slip, resulting in serious injury. Operate RIDING mowers up and down slopes, never across the face of slopes. Operate WALK-BEHIND mowers across the face of slopes, never up and down slopes.

EMISSION CONTROL SYSTEMS WARRANTY

(Owner's Defect Warranty Rights and Obligations)

In the interest of the environment, Briggs & Stratton engines that meet strict emission requirements are labeled, "This ULGE engine conforms to 1995-1998 California Emission Control Regulations." EMISSION CONTROL SYSTEMS WARRANTY COVERAGE IS APPLICABLE ONLY TO ENGINES PURCHASED IN CALIFORNIA IN 1995 AND THEREAFTER WHICH ARE USED IN CALIFORNIA.

CALIFORNIA EMISSION CONTROL DEFECTS WARRANTY STATEMENT

The California Air Resources Board and Briggs & Stratton Corporation are pleased to explain the emission control systems warranty on your 1995 and later utility or lawn and garden equipment engine (ULGE). In California, new utility or lawn and garden equipment engines must be designed, built and equipped to meet the State's stringent anti-smog standards. The engine manufacturer must warrant the emission control system on your engine for the periods of time listed below provided there has been no abuse, neglect or improper maintenance of your utility or lawn and garden equipment engine.

Your emission control system includes parts such as the carburetor, air cleaner, ignition system, muffler and catalytic converter. Also included may be connectors and other emission related assemblies.

Where a warrantable condition exists, your authorized dealer or a Briggs & Stratton service dealer will repair your utility or lawn and garden equipment engine at no cost to you including diagnosis, parts and labor.

EMISSION CONTROL DEFECTS WARRANTY COVERAGE

The utility or lawn and garden equipment engines are warranted relative to emission control parts defects for a period of two years, subject to provisions set forth below. If any covered part on your engine is defective, the part will be repaired or replaced by your authorized dealer or a Briggs & Stratton service dealer.

OWNER'S WARRANTY RESPONSIBILITIES

As the utility or lawn and garden equipment owner, you are responsible for the performance of the required maintenance listed in your Owner's Manual. The engine manufacturer recommends that you retain all receipts covering maintenance on your utility or lawn and garden equipment engine, but the engine manufacturer cannot deny warranty solely for the lack of receipts or for your failure to ensure the performance of all scheduled maintenance.

As the utility or lawn and garden equipment engine owner, you should be aware, however, that the engine manufacturer may deny you warranty coverage if your utility or lawn and garden equipment engine or a part has failed due to abuse, neglect, improper maintenance or unproved modifications.

You are responsible for presenting your utility or lawn and garden equipment engine to your authorized dealer or a Briggs & Stratton service dealer as soon as a problem exists. The undisputed warranty repairs should be completed in a reasonable amount of time, not to exceed 30 days.

If you have any questions regarding your warranty rights and responsibilities, you should contact your authorized dealer.

The emission warranty is a defects warranty. Defects are judged on normal engine performance. The warranty is not related to an in-use emission test.

EMISSION CONTROL DEFECTS WARRANTY PROVISIONS

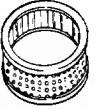
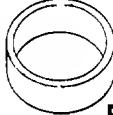
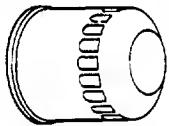
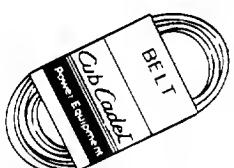
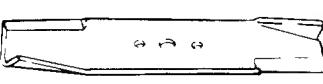
The following are specific provisions relative to your Emission Control Defects Warranty Coverage. It is in addition to the manufacturer's engine warranty.

1. **Warranted Parts – Coverage** under this warranty extends only to the parts listed below (the emission control systems parts) to the extent these parts were present on the engine purchased.
 - a. Fuel Metering System
 - Cold start enrichment system (soft choke)
 - Fuel pump
 - b. Air Induction System
 - Air cleaner
 - Carburetor and internal parts
 - Intake manifold
 - c. Ignition System
 - Spark plug(s)
 - Magneto ignition system
 - d. Catalyst System
 - Catalytic converter
 - Exhaust manifold
 - Air injection system or pulse valve
 - e. Miscellaneous items used in above systems
 - Vacuum, temperature, position, time sensitive valves and switches
 - Connectors and assemblies
2. **Length of Coverage** – The engine manufacturer warrants to the initial owner and each subsequent purchaser that the "warranted parts" shall be free from defects in materials and workmanship which caused the failure of the "warranted parts" for a period of two years from the date the engine is delivered to a retail purchaser.
3. **No Charge – Repair or replacement** of any "warranted part" will be performed at no charge to the owner, including diagnostic labor which leads to the determination that a "warranted part" is defective, if the diagnostic work is performed at your authorized dealer or an authorized Briggs & Stratton service dealer. For emission warranty service contact your nearest authorized dealer or Briggs & Stratton service dealer as listed in the "Yellow Pages" under "Engines, Gasoline," "Gasoline Engines," "Lawn Mowers," or similar category.
4. **Claims and Coverage Exclusions** – Warranty claims shall be filed in accordance with the provisions of the Engine Warranty Policy. Warranty coverage shall be excluded for failures of "warranted parts" which are not original Briggs & Stratton parts or because of abuse, neglect or improper maintenance as set forth in the Engine Warranty Policy. Briggs & Stratton is not liable to cover failures of "warranted parts" caused by the use of add-on, non-original or modified parts.
5. **Maintenance** – Any "warranted part" which is not scheduled for replacement as required maintenance or which is scheduled only for regular inspection to the effect of "repair or replace as necessary" shall be warranted as to defects for the warranty period. Any "warranted part" which is scheduled for replacement as required maintenance shall be warranted as to defects only for the period of time up to the first scheduled replacement for that part. Any replacement part that is equivalent in performance and durability may be used in the performance of any maintenance or repairs. The owner is responsible for the performance of all required maintenance, as defined in the Owner's Manual.
6. **Consequential Coverage** – Coverage hereunder shall extend to the failure of any engine components caused by the failure of any "warranted part" still under warranty.

MAINTENANCE PARTS CHART

MODELS 2160 AND 2165

SERIES 2000 16 HP VANGUARD

ENGINE OIL 	Engine Oil Requirements approx. . . 3-1/2 pints		Part No.	
	Cub Cadet engine oil Ambient temperature viscosity (Grade SG or SH) Above +40°F SAE30 0° to +40°F SAE 5W30 or 10W30 Below 0°F SAE 5W20 or 5W30			
AIR FILTER  CARTRIDGE	Air Filter Requirements		Part No.	
	Clean air filter per instructions in your owner's manual under maintenance air cleaner.			
 FOAM PRE-CLEANER			Cartridge BS-394018	
ENGINE OIL FILTER 	Engine Oil Filter Requirements		Part No.	
	Change every 50 hours			
SPARK PLUG 	Gap Requirements		Part No.	
	.030 inch gap			
TRANSMISSION OIL FILTER 	Oil Filter Requirements (2165 only)		Part No.	
	Change every 100 hours			
TRANSMISSION OIL 	Transmission Oil Requirements approx. . . . 6 qts		Part No.	
	Check before each use 1 quart 1 gallon			
BELTS 	Deck Blade Belt		Tractor to Deck Belt	
	Model	Part No.		
	46" Deck	754-3039	46" Deck	
	48" Deck	754-3041	48" Deck	
BLADES 	Original Equipment Blade		Hard Coated Blade	
	Size	Part No.	Size	Part No.
	46"	742-3015 Center (1)	48"	759-3677 (3)
		742-3016 Outer (2)		HI-Lift Blade
	48"	742-3019 (3)	48"	742-3025 (3)
				Bagging Blade
	Size	Part No.	Size	Part No.
	46"	742-3010 Center (1)	46"	759-3398 Center (1)
		742-3011 Outer (2)		759-3397 Outer (2)